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The TIMBER RESOURCES of the OHIO HILL COUNTRY

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NORTHEASTERN FOREST EXPERIMENT STATION, UPPER DARBY, PA.
FOREST SERVICE, U.S. DEPARTMENT OF AGRICULTURE
RICHARD D. LANE, DIRECTOR

FOREWORD

THIS report presents 1967 forest resource statistics for the Hill Country—Ohio's portion of Appalachia. The Hill Country comprises 28 counties, which were divided into three geographic sampling units for this survey. The Hill Country of the 1952 Ohio forest survey contained 26 of these counties. The additional Appalachia counties are Brown and Clermont in the South-Central Geographic Unit. The Southeastern and East-Central Units are the same as they were in the first survey. To facilitate making comparisons between inventories, we have adjusted 1952 Hill Country data to include Brown and Clermont Counties.

The resurvey of Ohio forests is part of the nationwide program to maintain a current inventory of our timber resources, as authorized by the McSweeney-McNary Forest Research Act of 1928. Because forestry is so important in the Hill Country, the resurvey there was intensified to obtain more precise county information. The appropriation of $75,000 by the Ohio State Legislature made the intensification possible.

The Division of Forestry and Reclamation of the Ohio Department of Natural Resources and the U.S.D.A. Forest Service planned the resurvey. Carl E. Mayer, project leader, directed the resurvey. Joseph E. Barnard was in charge of computing and tabulating all inventory data, including those for the Wayne National Forest, which were collected by personnel of the Eastern Region of the U.S.D.A. Forest Service. Members of the Northeastern Forest Experiment Station's survey unit collected the basic inventory data for all lands outside the Wayne National Forest. With the assistance of Division of Forestry and Reclamation personnel, they collected timber cut and timber products output data. The field work was completed in December 1967.

We acknowledge, with special thanks the cooperation of the Agricultural Stabilization and Conservation Service, who provided up-to-date aerial photographs for use in the resurvey.

The TIMBER RESOURCES of the OHIO HILL COUNTRY

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The Hill Country of Ohio and the geographic sampling units used for the resurvey.

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RESOURCE TRENDS

THE FIRST comprehensive forest survey in Ohio, conducted from 1951 to 1953, was made at an ideal time to reflect the return to forest of previously farmed or cutover lands, to evaluate some of the practices promoted by the conservation movement that gained force in the 1900's, and to assess the results of the demands World War II had made on Ohio forests.

The survey pointed to an upturn in forest area. It indicated that, although northern and western Ohio contained scattered tracts of sawtimber, most of Ohio's 5.4 million acres of commercial forest land[1] were in the Hill Country and that most of them were in poletimber stands. Apparently the combination of reverting forests, fire protection, and wartime cutting had had a great impact on the Hill Country.

The 1952 survey sugested that additions to forest land in southeastern Ohio would, for a time, balance losses in the rest of the State; that a rapid buildup of sawtimber volume would occur in the Hill Country; and that the need for better forest management, long advocated, must be revoiced to get "increased production from the available forest land."[2]

Fifteen years have passed—not long in the history of Ohio's forests, but enough time to observe current trends. The new forest survey indicates that forest area in the Hill Country has increased at a rate greater than that anticipated in 1952. The increase has more than offset the land clearing that took place in western Ohio during the early 1960's and has added prominence to the Hill Country in the State's timber outlook.

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[1] See appendix for definitions of this and other terms used in this report.

[2] Hutchison, O. Keith, and James T. Morgan. OHIO'S FORESTS AND WOOD-USING INDUSTRIES. USDA Forest Serv. Central States Forest Expt. Sta. Forest Survey Release 19. 40 pp., illus. Columbus, Ohio. 1956.

The sawtimber buildup predicted in 1952 has materialized in the Hill Country, mainly in trees 12 to 16 inches d.b.h. In addition, there is a good crop of healthy young poletimber trees. As they mature, these trees will continue the already favorable increase of sawtimber volume and, at the same time, will be replaced by young growth on forest land that is currently restocking.

Thus the trends suggested by the 1952 survey have been and are taking place. But the need for additional forest management remains. Using the information from this latest survey, we will be able to further evaluate resource trends and to determine possible problem areas requiring management.

INVENTORY HIGHLIGHTS

- Commercial forest area increased by one-third: from 3.3 million acres in 1952 to 4.4 million acres in 1967.
- Commercial forest land now covers one-half of the Hill Country.
- Volume of growing stock increased 30 percent between inventories and now amounts to 2.9 billion cubic feet.
- Volume of sawtimber is 9.8 billion board feet—32 percent more than in 1952.
- Average net annual growth of growing stock exceeded 100 million cubic feet between 1952 and 1967.
- Net annual growth of sawtimber averaged more than 340 million board feet.

THE FOREST SITUATION

One-Third More Forest

Since 1952 the area of forest land in the Hill Country increased from 3.3 to 4.4 million acres. Much of the increase resulted from abandoned farmland reverting to forests and from strip-mine reclamation. This is especially true in the East-Central Geographic Unit, where the increase of nearly 600 thousand acres of forest land accounts for more than half of that found in the Hill Country.

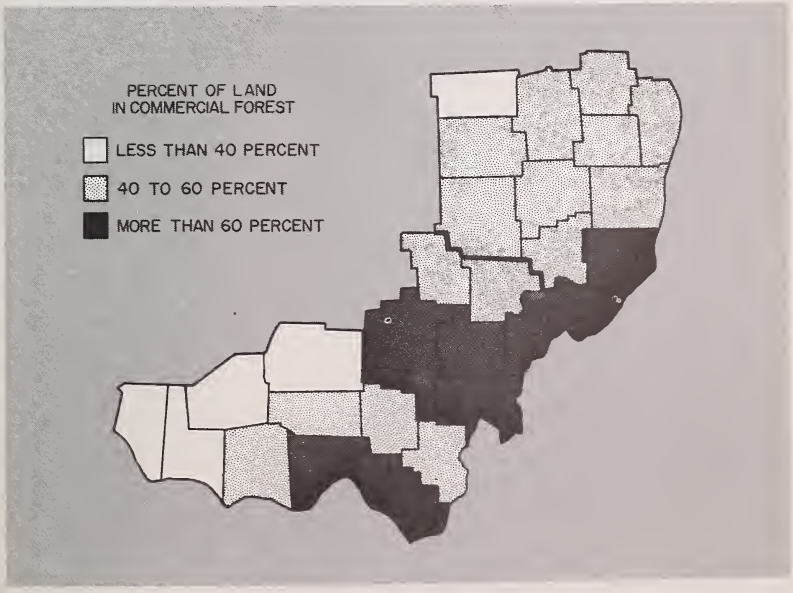
Every county in the Region but Adams gained forest area between surveys. In general, those with the least forest in 1952 showed the greatest gains. Forest area more than doubled in Noble County and nearly doubled in Carroll, Harrison, and Holmes Counties.

As a result of this buildup in forest area, the Hill Country, covering only one-third of Ohio, accounts for about 70 percent of the State's woodlands.

Half of Hill Country Is Now Forested

Forests, nearly all of which are commercial, now cover half the land area in southeastern Ohio. Noncommercial forest land amounts to only 35 thousand acres and consists entirely of publicly owned forest land that is reserved for timber production. No forest land in the Hill Country is considered unproductive because of adverse site conditions.

The highest concentration of commercial forest land is in the Southeastern Unit.



The Southeastern Geographic Unit still has the highest concentration of commercial forest land, although each of the other two units has more forest land. Vinton County, with 74 percent of its area in commercial forest, is still the most densely forested county in Ohio; however, seven other counties are now 60 percent or more forested—Athens, Hocking, Lawrence, Meigs, Monroe, Scioto, and Washington. Scioto, with 259,500 acres, has more commercial forest land than any other Ohio county.

Only five of the 28 southeastern Ohio counties are less than 40 percent forested. This indicates that, in addition to expanding, forest area in the Hill Country is becoming more evenly distributed.

Fifty-Six Percent of Forest Is in Sapling-Seedling Stands

According to present standards, 2.4 million acres of Hill Country forests are now classified as sapling-seedling stands (restocking), and only 1.3 million acres are classified as sawtimber stands. At first glance the area in sapling-seedling stands appears to have increased about 4½ times since the first survey, while the area in sawtimber appears to have dropped slightly. However, the stand-size classifications used in the resurvey are different from those used in the original survey.[3] Therefore the stand-size data in this report cannot be compared directly with similar data from the first survey.

Most of the stands now classified as sapling-seedling are lands that have reverted to forest and contain little or no merchantable volume. But many of them are stands that contain a high proportion of rough or rotten trees. In stands of this sort, if the stocking of saplings and seedlings exceeds that of larger growing-stock trees, the stands are now classed as sapling-seedling. They may have sufficient volume per acre to have been called poletimber or sawtimber stands according to the 1952 definitions. Actually, one of every 2 acres of commercial forest land in the Hill Country now contains at least 1,500 board feet of sawtimber

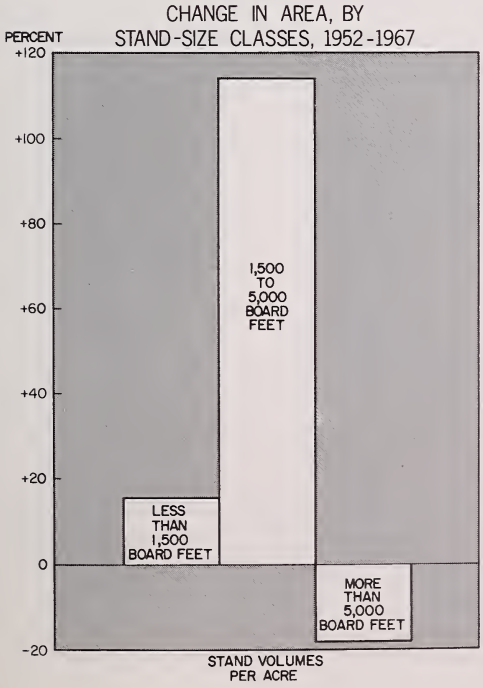
[3] In the 1967 survey, stand-size classifications were based on stocking by growing-stock trees. In the 1952 survey they were based primarily on volume per acre.

and thus meets the minimum formerly used to class sawtimber stands. The area in these stands represents an increase of 50 percent between surveys.

Regardless of how they are classed, a closer look at many of the Hill Country stands indicates that widespread management—planting or brush control in restocking stands and timber stand improvement or regeneration cutting in larger timber—is needed to get the stands into optimum production in the least time.

Area of Large Sawtimber is Declining

The increase in area of stands with 1,500 or more board feet per acre might better be called a net increase or net change. Actually, the area in small sawtimber stands—those averaging between 1,500 to 5,000 board feet per acre—has more than doubled since 1952; but the area in large sawtimber stands—those with



The area in large sawtimber stands has declined.

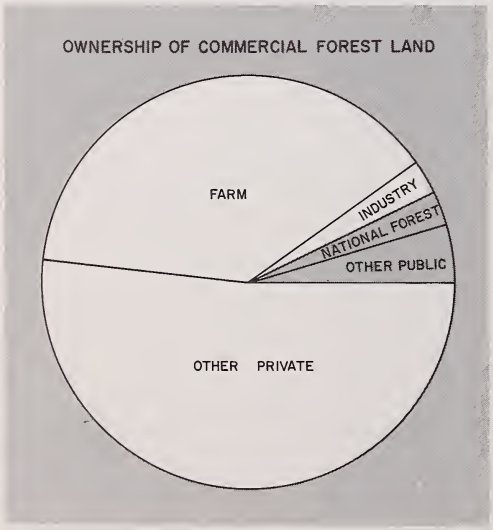
more than 5,000 board feet per acre—has declined by about one-fifth. This means that young sawtimber stands are developing to replace many of the mature and overmature stands that are being harvested.

Nonfarm Owners Are Increasing

Ninety-three percent of the commercial forest land in southeastern Ohio is privately owned. The remaining 7 percent—304 thousand acres—is publicly owned. Thus, the ratio of public to private ownership has not changed since 1952.

About one-third of the publicly owned commercial forest land is in the Wayne National Forest. The other two-thirds are held by other public owners, primarily the Ohio Department of Natural Resources. This breakdown, too, has remained the same since the first survey.

A trend away from farmer-owners has developed within the private sector, where most of the expansion in commercial forest area took place. During the past 15 years the amount of commercial forest land owned by farmers increased by 250 thousand acres, while that owned by nonfarmers increased by 780 thou-



Over 90 percent of the commercial forest land is privately owned.

sand acres—more than 3 times as much. During the same period the land in farms in southeastern Ohio declined by about one-fourth[4]. These trends indicate a continued buildup of forest area as trees invade land that formerly had been cropped or pastured. They also suggest possible shifts in objectives for the use of the land as it becomes the property of a more diverse group of owners.

Annual Growth Exceeds 100 Million Cubic Feet

The average net annual growth between 1952 and 1967 in southeastern Ohio was 104 million cubic feet for growing stock and 341 million board feet for sawtimber. Expressed as a percent of 1967 inventory volumes, this average net annual growth amounts to rates of 3.6 percent for growing stock and 3.5 percent for sawtimber. Ingrowth accounts for most of the growth in each of these two volume classes.

Mortality, used in part to determine the average net annual growth, averaged less than 1 percent. However, elm mortality was 3 percent annually, mainly because of Dutch elm disease.

Growth Is Below Potential

The average net annual growth per acre is now less than 25 cubic feet, well below the region's potential. Over three-fifths of the Hill Country timberland is capable of producing more than 50 cubic feet per acre per year, and almost one-fourth could produce more than 85 cubic feet per acre per year (potential expressed in terms of mean annual growth at culmination of increment in fully stocked stands). However, little more than half of the commercial forest acres are well stocked with growing-stock trees. Stocking must be improved before the region's full growth potential can be realized.

Growth Exceeds Removals

Timber growth, despite being below potential, has exceeded average annual timber removals by a wide margin during the past

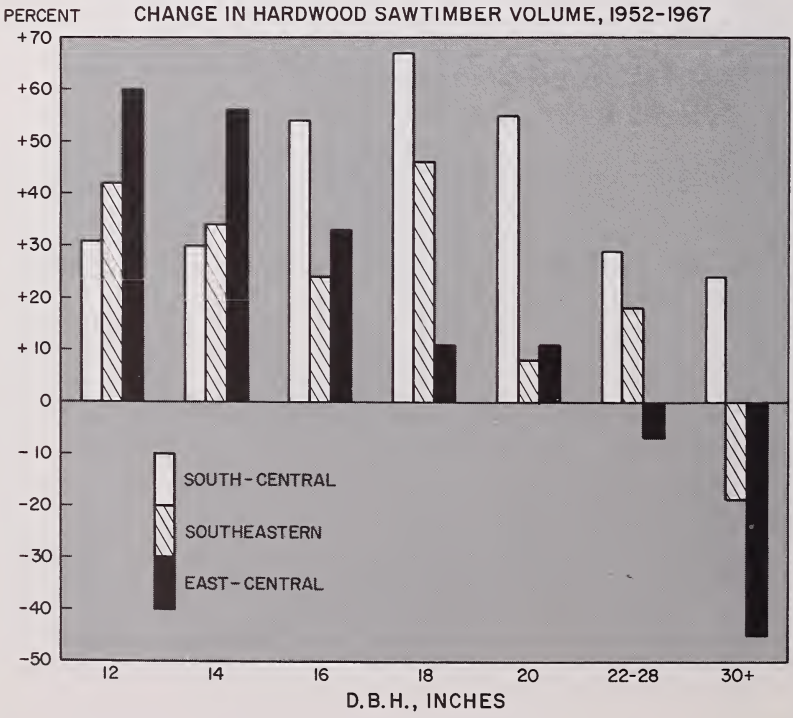
[4] U. S. Bureau of the Census. Census of Agriculture, 1964.

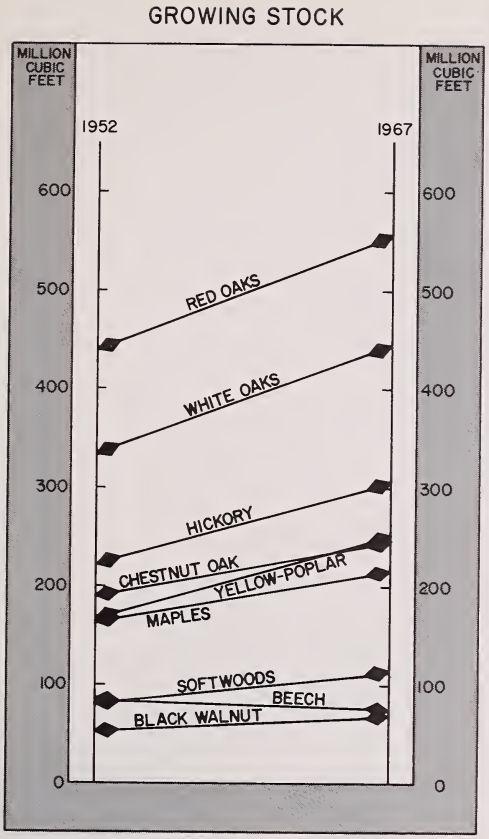
15 years. Annual removals have averaged 42 million cubic feet for growing stock and 131 million board feet for sawtimber. Thus the growth-to-cut surplus has increased the growing-stock and sawtimber volumes in the region by 2 percent annually. However, most of the growth has been in poletimber and small sawtimber trees while much of the cut has been from large sawtimber trees. As a result there has been a general thickening up of the forest stands in the Hill Country.

Timber Volume Up

Growing-stock volume increased by 30 percent between surveys and now totals 2.9 billion cubic feet. Included in the growing stock are 9.8 billion board feet of sawtimber—up 32 percent since 1952. These increases, although substantial, have not been

Only in the South-Central Unit was sawtimber volume added in all diameter classes.





The major species showed substantial increases in growing-stock volume.

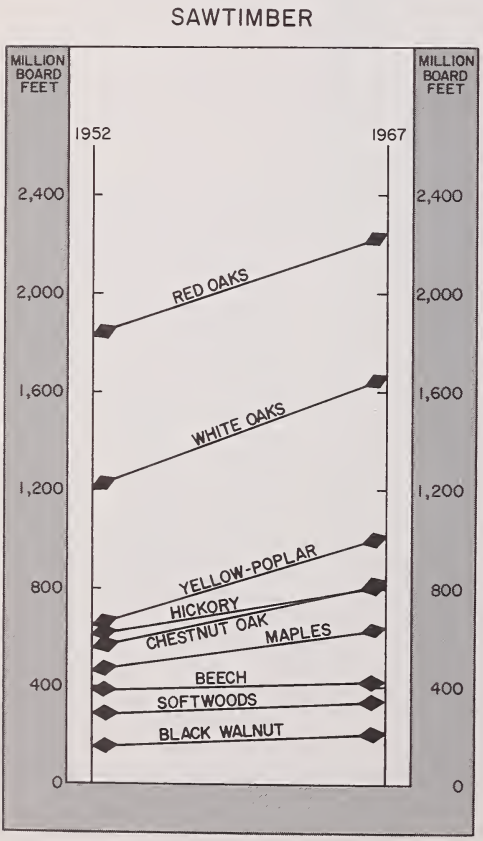
uniform. Important changes have taken place in the distribution of timber volume by tree size and by location.

Healthy volume increases have occurred across all diameter classes except the largest, where cutting and mortality have been concentrated. However, the most rapid volume buildup has taken place in the smaller diameter classes. In fact, trees 16 inches d.b.h. and smaller account for more than 80 percent of the increases in growing-stock and sawtimber volumes.

The changes in volume distribution are even more pronounced at the geographic unit level. Growing-stock volumes have increased by about the same proportion in each of the three sampling units, but sawtimber volumes have not. In the South-Central

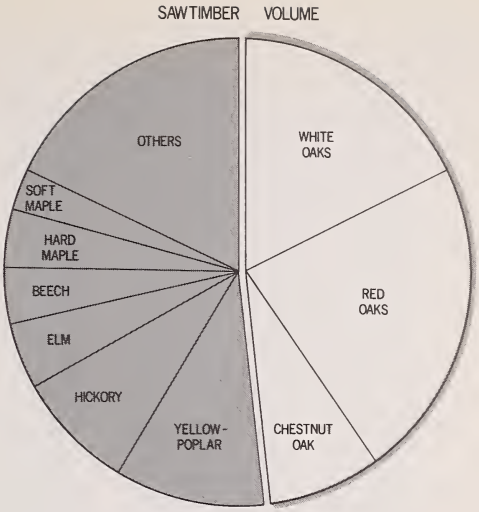
Unit, where forest area increased only slightly, sawtimber volume increased by about 40 percent. Only in the South-Central Unit was sawtimber volume added in all diameter classes. In the East-Central Unit, where forest area expanded by more than 55 percent, sawtimber volume increased by only 25 percent.

Except for beech, major species all showed substantial volume increases between 1952 and 1967. Especially noteworthy are the gains in sawtimber volume of yellow-poplar (58 percent) and black walnut (30 percent). Remember, however, that species distributions, like distributions by tree size, are not uniform throughout the Region. Similarly, the increase in volume for any given species may vary considerably from one part of the Hill Country to another.



Most species showed gains in sawtimber volume.

The oaks make up nearly half the sawtimber volume.



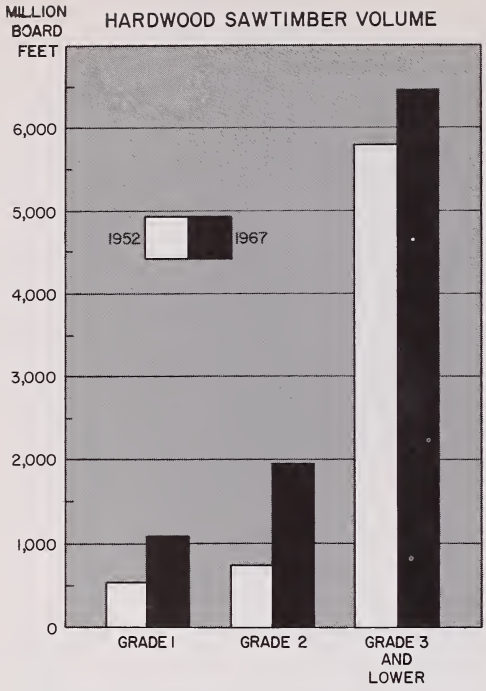
Oaks Predominate

The Hill Country is hardwood country. Nearly nine-tenths of the forest land is in hardwood forest cover types—mainly oak-hickory. The oaks make up more than two-fifths of the growing-stock volume and nearly half of the sawtimber volume. Volume in the red oak group is approximately equal to that of the white oaks and chestnut oak combined. These species, along with hickory and yellow-poplar, account for more than 60 percent of the merchantable timber.

Comparisons between surveys indicate that the area in pine and oak-pine types has increased by two and one-half times and now amounts to more than 500 thousand acres. Nearly half the increase took place in the East-Central Unit. The East-Central Unit also accounts for almost three-fourths of the increase in softwood growing-stock volume.

Timber Quality Is Improving

Two-thirds of the sawtimber volume is in low-grade material. However, much of the volume in standard lumber log grade 3 is classified as such simply on the basis of size—two-thirds of the



Although log quality is improving, two-thirds of the sawtimber volume is classed as grade 3 or lower.

sawtimber volume in southeastern Ohio is in trees less than 17 inches d.b.h. As these trees grow larger, many of them will increase in quality.

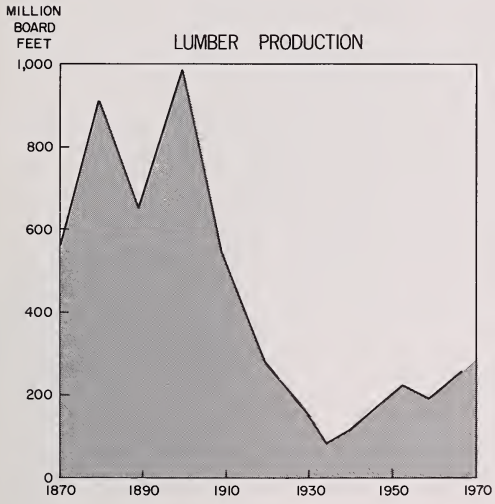
About 12 percent of the hardwood sawtimber volume is in standard lumber log grade 1, and about 20 percent is in standard lumber log grade 2. The total volume in these two grades (3.1 billion board feet) has more than doubled during the past 15 years. Remember, however, that although the overall timber quality situation is improving in the Hill Country, the distribution of volume by log grade varies with species and location.

TIMBER INDUSTRY TRENDS

Lumber Production Is Increasing

Most of the Hill Country's primary wood-using firms are sawmills—more than 200 scattered throughout the Region. Their total lumber output exceeded 180 million board feet in 1966.

This single year output should not be confused with the average annual timber removal for the 15 years—131 million board feet. The difference between the two figures simply indicates that the 1966 lumber production in the Hill Country was greater than the average annual removal of sawtimber for all purposes between surveys. Actually, lumber production has been increasing in the Hill Country for the past several years. This trend has been noted for the State as a whole. At the same time, the number of sawmills has declined. In 1952 the average output per sawmill in Ohio was only about 100,000 board feet annually. In 1966 the average output per mill in the Hill Country was more than 850,000 board feet.



Lumber production has been increasing in Ohio for the past several years.

Pulpwood Production Is Expanding Rapidly

Ohio's 1966 round pulpwood production, 337,000 cords, represents a ten-fold increase over that in 1952. Eighty-eight percent of the round pulpwood harvest came from the Hill Country. The Region also supplied most of the 39,000 cords of pulp chips produced in the State in 1966. The round pulpwood and chips were

consumed by woodpulp mills both within (two of Ohio's six mills are in the Hill Country) and outside the State.

As a result of the tremendous increase in southeastern Ohio's pulpwood production, the pulpwood industry now rivals the lumber industry in terms of volume produced. The implications of continued expansion in the pulpwood industry are important to the Hill Country, not only in the strict economic sense, but also because the pulp market provides an outlet for small timber. The lack of such a market has hindered the adoption of forest-management practices in many areas of the Midwest.

A LOOK TO THE FUTURE

Up to now we have described the Hill Country forests, pointed out some of the trends in their development and in the development of the region's forest industries, and indicated some needs for possible forest management activities. But what about the outlook for the Hill Country woodlands?

We can expect the buildup in the region's forest base to continue. Forest area should continue to increase at the current rate of about 2 percent annually—at least through the next decade.

Decline of agriculture, the shift toward nonfarm land ownership, and strip-mine reclamation will account for the forest area increases. However, we might expect the increase to drop to a lower rate, or even cease, sometime before the turn of the century because of population pressures and a demand for additional recreation land. Of more immediate importance in large areas of the Hill Country are current developments in the use of larger earthmoving equipment in strip-mining. The use of such equipment, making deeper coal seams accessible, could greatly affect the forest patterns in those areas: first, through timber removals, and second, through subsequent additions to forest area by natural regeneration or reclamation.

The current surplus of growth over cut indicates that the timber volume should continue to increase. In addition, poletimber ingrowth in stands that are currently restocking will further expand the region's growing-stock volume. Thus we can expect the poletimber buildup to accelerate, and the already favorable increase

in sawtimber volume to continue. Timber quality should also improve, but at a lower rate than the overall increase in sawtimber volume.

The anticipated increases in forest area and timber volume will not, in themselves, promote the widespread development of the timber industry, although they may encourage certain firms to expand production or to locate in the region. In other words, the demand for timber will not necessarily grow in proportion to the supply.

The demand for Hill Country timber depends primarily on the quantity of forest products that can be profitably marketed by primary wood-using firms that obtain their raw materials from the region. Much of the present timber supply cannot be profitably manufactured into products; so there is little demand for it. Much of it is too small or too poor in quality. Some species have little use. In many areas desirable trees are thinly scattered, and merchantable stands are located too far from possible users. Unless forest-management activities are stepped up in the region, the future timber supply may well fall short of the potential demand.

Many of the influences that will determine the potential demand for Hill Country timber have already begun working. Because the large number of round pulpwood and lumber-producing firms in the area have relatively few markets for their products, no one firm has been able to command the sale price of its output. The existing firms and others interested in developing timber industries in the Hill Country are undertaking various alternatives to increase profits and to promote resource use. They are seeking out additional markets, improving marketing systems for current poducts, and encouraging the manufacturers of secondary products to locate in the area. The likely alternative for most of the existing firms has been to direct their efforts at lowering production costs. For most this has meant capital investment for equipment to increase utilization and production efficiency and has resulted in an expansion in plant capacity.

These trends are expected to continue and, with them, the added demand for timber. To insure the kind and amount of raw

materials future wood-using firms will need, more of the timber owners will have to become timber producers.

Present conditions in the Hill Country favor the mutual development of timber supplies and forest industry demand. The forests are spread rather evenly, and the volume is distributed fairly well by size class. Many of the stands are at an age where cultural operations are both needed and feasible. The region's pallet and pulpwood-producing firms currently provide an outlet for the type of material removed in such operations. The suitability of the Hill Country's future timber will be determined by the willingness of forest land owners to match the development of the region's timber users.

■

APPENDIX

DEFINITIONS OF TERMS

Land Area Classes

Land area.—(a) *Bureau of the Census.* The area of dry land and land that is temporarily or partly covered by water, such as marshes, swamps, and river flood plains; streams, sloughs, estuaries, and canals that are less than 1/8 statute mile in width; and lakes, reservoirs, and ponds that are less than 40 acres in area. (b) *Forest Survey.* The same as the Bureau of the Census, except that the minimum width of streams, etc., is 120 feet, and the minimum size of lakes, etc., is 1 acre.

Forest land.—Land that is at least 10 percent stocked (contains at least 7.5 square feet of basal area) by forest trees of any size, or formerly had such tree cover, and is not developed for nonforest use. (Forest trees are woody plants that have a well developed stem and are usually more than 12 feet in height at maturity.)

Commercial forest land.—Forest land that is producing or capable of producing crops of industrial wood and is not withdrawn from timber utilization. *(Industrial wood:* all roundwood products, except fuelwood.)

Noncommercial forest land.—Forest land that is incapable of yielding timber crops because of adverse site conditions (unproductive forest land), and productive forest land that is withdrawn from commercial timber use through statute or administrative regulations (productive-reserved forest land).

Productive-reserved forest land.—Forest land that is sufficiently productive to qualify as commercial forest land, but is withdrawn from timber utlization through statute or administrative designation.

Unproductive forest land.—Forest land that is incapable of producing 20 cubic feet per acre of industrial wood under natural conditions because of adverse site conditions.

Nonforest land.—Land that has never supported forests; and land formerly forested but now in nonforest use such as crops, pasture, urban areas, and the like.

Ownership Classes

National forest.—Federal lands that have been legally designated as National Forests or purchase units, and other lands that are under the administration of the Forest Service.

Other public.—Public lands (other than those classified as National Forest) owned by Federal, state, county, and local public agencies, or lands leased by such governmental units for more than 50 years.

Other Federal.—Federal lands other than National Forests that are administered by other Federal agencies.

State.—Lands that are owned by the State of Ohio or leased to the State for 50 years or more.

County and municipal.—Lands that are owned by counties and local public agencies or municipalities or leased to them for 50 years or more.

Forest industry.—Lands that are owned by companies or individuals operating wood-using plants.

Farmer-owned.—Lands that are owned by farm operators. Excludes land leased by farm operators from nonfarm owners.

Miscellaneous private.—Privately owned lands other than forest-industry and farmer-owned lands.

Stand-size Classes

Stand.—A growth of trees on a minimum of 1 acre of forest land that is at least 16.7 percent stocked by forest trees of any size.

Sawtimber stands.—Stands that are at least 16.7 percent stocked with growing-stock trees (see definitions under Tree Classes), with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber stands.—Stands that are at least 16.7 percent stocked with growing-stock trees of which half or more of this stocking is in poletimber and/or sawtimber trees and with poletimber stocking exceeding that of sawtimber.

Sapling-seedling stands.—Stands that are at least 16.7 percent stocked with growing-stock trees of which more than half of the stocking is saplings and/or seedlings.

Nonstocked areas.—Commercial forest lands that are less than 16.7 percent stocked with growing-stock trees.

Stocking Classes

Stocking.—The degree of occupancy of land by trees, measured in terms of basal area and/or the number of trees in a stand compared to the basal area and/or number of trees required to utilize fully the growth potential of the land. The actual stocking at a point was evaluated against a standard of 75 square feet of basal area per acre. The stocking percentage for a sample plot is derived from the stocking for each of 10 points. Two categories of stocking were used:

- All live trees.—These are used in the classification of forest land and forest types.
- Growing-stock trees.—These are used in the classification of stand-size classes.

The degree of plot stocking is viewed as a range of values rather than single points. A fully stocked stand lies within the range of 100 to 133 percent of the basal-area standard. An overstocked stand contains more than 133 percent of basal-area standard. The range for medium stocking is 16.7

to 60 percent of the basal-area standard. Forest land with less than 16.7 percent of the basal-area standard is classified as nonstocked.

Tree Classes

Growing-stock trees.—Live trees of commercial species that are classifiedr as sawtimber, poletimber, saplings, and seedlings; that is, all live trees except rough and rotten trees. (See definitions under Class of Timber.)

Acceptable trees.—Growing-stock trees of commercial species that meet specified standards of size and quality, but do not qualify as desirable trees.

Desirable trees.—Growing-stock trees of commercial species (a) that have no serious defects in quality that limit present or prospective use for timber products, (b) that are of relatively high vigor, and (c) that contain no pathogens that may result in death or serious deterioration before rotation age.

Rotten trees.—Live trees of commercial species that do not contain at least one 12-foot sawlog, now or prospectively, and/or do not meet regional specifications for freedom from defect primarily because of rot; that is, when more than 50 percent of the cull volume in the tree is rotten.

Rough trees.—(1) The same as above, except that rough trees do not meet regional specifications for freedom from defect primarily because of roughness or poor form, and (2) live trees that are of noncommercial species.

Site-Quality Classes

Site class.—A classification of forest land in terms of inherent capacity to grow crops of industrial wood. Classifications are based upon the mean annual growth of growing stock attainable in fully stocked stands at culmination of mean annual growth.

Forest Types

The forest-type classification of each sample plot is based upon the species that make up a plurality of live tree stocking. The many local forest types were combined into the following major forest types.

White-red pine.—Forests in which eastern white pine or red pine, singly or in combination, make up a plurality of the stocking. (Common associates include hemlock, aspen, birch, and maple.)

Virginia-shortleaf pine.—Forests in which Virginia pine, shortleaf pine, or other southern yellow pines, singly or in combination, make up a plurality of the stocking. (Common associates include oak, hickory, and gum.)

Oak-pine.—Forests in which hardwoods (usually upland oaks) make up a plurality of the stocking, but in which pines make up 25 to 50 percent of the stocking. (Common associates include gum, hickory, and yellow-poplar.)

Oak-hickory.—Forests in which upland oaks or hickory, singly or in combination, make up a plurality of the stocking, except where pines make up 25 to 50 percent, in which case the stand would be classified oak-pine. (Common associates include yellow-poplar, elm, maple, and black walnut.)

Oak-gum.—Bottomland forests in which blackgum, sweetgum, or oaks, singly or in combination, make up a plurality of the stocking, except where pines make up 25 to 50 percent in which case the stand would be classified oak-pine. (Common associates include cottonwood, willow, ash, elm, hackberry, and maple.)

Elm-ash-cottonwood.—Forests in which elm, ash, or cottonwood, singly or in combination, make up a plurality of the stocking. (Common associates include willow, sycamore, beech, and red maple.)

Maple-beech-birch.—Forests in which sugar maple, beech, or yellow birch, singly or in combination, make up a plurality of the stocking. (Common associates include hemlock, elm, basswood, and white pine.)

Aspen-birch.—Forests in which aspen, paper birch, or gray birch, singly or in combination, make up a plurality of the stocking. (Common associate is maple.)

Class of Timber

Softwoods.—Coniferous trees, generally evergreen, that have needles or scalelike leaves.

Hardwoods.—Dicotyledonous trees that are generally broad-leaved and deciduous.

Sawtimber trees.—Live trees of commercial species that: (a) have these minimum diameters at breast height—softwoods 9.0 inches and hardwoods 11.0 inches; (b) contain at least one 12-foot merchantable sawlog; and (c) meet regional specifications for freedom from defect.

Poletimber trees.—Live trees of commercial species that meet regional specifications of soundness and form, and are at least 5.0 inches d.b.h., but are smaller than sawtimber size.

Saplings.—Live trees of commercial species 1.0 to 5.0 inches in diameter at breast height and of good form and vigor.

Seedlings.—Live trees of commercial species less than 1.0 inch in diameter at breast height that are expected to survive according to regional standards.

Rough and rotten trees.—See definitions under *Tree Classes*.

Timber Volume

Growing-stock volume.—Net volume, in cubic feet, of live growing-stock trees that are 5.0 inches d.b.h. and over from a 1-foot stump to a minimum 4.0-inch top diameter outside bark of the central stem, or to the point where the central stem breaks into limbs.

Standard cord.—A unit of measure for stacked bolts of wood encom-

passing 128 cubic feet of wood, bark, and air space. Cord estimates can be derived from cubic-foot estimates by applying an average factor of 80 cubic feet of wood (inside bark) per rough cord.

Sawtimber volume.—Net volume in board feet, International 1/4-inch rule, of merchantable sawlogs in live sawtimber trees. Net volume equals gross volume less deductions for rot, sweep, and other defects that affect use for lumber.

Sawlog.—A log that meets minimum standards of diameter, length, and defect, including logs at least 8 feet long, sound and straight and with a minimum diameter inside bark of 6 inches for softwoods and 8 inches for hardwoods. (See specifications under *Log Grade Classification.)*

Sawlog portion.—That part of the bole of sawtimber trees between the stump and the sawlog top (merchantable top).

Sawlog top.—The point on the bole of sawtimber trees above which a sawlog cannot be produced. The minimum sawlog top is 7.0 inches d.o.b. for softwoods and 9.0 inches d.o.b. for hardwoods.

Upper-stem portion.—That part of the bole of sawtimber trees above the sawlog top to a minimum top diameter of 4.0 inches outside bark or to the point where the central stem breaks into limbs.

Log Grades

The standard-lumber log grades for white pine, yellow pines, and hardwoods, and the specifications for hardwood tie-and-timber logs, are given below.

WHITE PINE LOG GRADES
Trial specifications (revised)

Log grade	*Minimum size*		*Defect allowance*		*Maximum weevil injury*	*Allowable knot size (inches on 3 best faces or minimum clearness on 4 faces)*
	Diameter	*Length*[1]	*Sweep or crook*	*Total cull including sweep*		
	Inches 12 & 13	*Feet* 8-16	*Percent* 20	*Percent* 50	*Number* 0	4 faces free of knots 1/2 inch or larger full length of log.
No. 1 (Select)	14 +	10-16	20	50	0	2 faces free of knots 1/2 inch or larger full length of log, or 4 faces free of knots 1/2 inch or larger 50 percent length of log (6 feet minimum length).[2]
No. 2 (Finish)	6 +	8-16	30	50	0	Sound red knots $\leq$[3] D/6 and no longer than 3 inches. Black knots: Butt logs $\leq$ (D/12) and no larger than 1 1/2 inches. Upper logs $\leq$ (D/10) and no larger than 1 1/2 inches or 4 faces free of knots 1/2 inch or larger 50 percent length of log.
No. 3 (Premium)	6 +	8-16	40	50	8-foot logs: 1 weevil 10-foot + logs: 2 weevils	Sound red knots $\leq$ D/3 and no larger than 5 inches. Black knots $\geq$ D/6 and no larger than 2 1/2 inches.
No. 4 (Standard)	6 +	8-16	50	50	No limit	No limit.

[1] Plus trim.
[2] If the sum of the diameters of sound red knots plus 2 times (sum of the diameters of dead or black knots) in inches is $\leq$ 1/2 the diameter of the log (in inches).
[3] $\leq$ means equal to or less than.

YELLOW PINE LOG GRADES[1]

Log grade	*Minimum diameter and maximum aggregate knot criteria*		
	With 4 visible faces	*With 3 visible faces*	*With 2 visible faces*
No. 1	D = >17 and 5K = <D	D = >17 and 7K = <D	D = >17 and 10K = <D
No. 2	D = >10 and 2K = <D <5K	D = >10 and 3K = <D <7K	D = >10 and 4K = <D <10K
No. 3	D = >5 and D <2K	D = >5 and D <3K	D = >5 and D <4K
No. 4	D = >5, but not qualified for higher grade after compliance with the following degrade rules: (A) Degrade any log one grade if D equals or is less than 3 times sweep of at least 3 inches. (B) Then degrade any non-grade No. 4 log one grade if massed heart-rot hyphae visible on circumferential log surface suggest that fruiting has occurred or is imminent. (C) Then degrade any grade No. 3 log to Grade No. 4 if bad knots are too dispersed for containment in a 90-degree radial sector extending 1/4 of log length.		

[1] From USDA Forest Service, 1953 Interim Log Grades for Southern Pine, October 1953.

HARDWOOD LUMBER LOGS

Grade factors *		*Specifications*							
		Log grade 1			*Log grade 2*				*Log grade 3*
Position in tree		Butts only	Butts and uppers		Butts and uppers				Butts and uppers
Minimum diameter (inches)		13-15[1]	16-19	20+	11[2]	12+			8+
Minimum length (feet)		10+	10+	10+	10+	8-9	10-11	12+	8+
Clear cuttings** on each of the 3 best faces	Minimum length (feet)	7	5	3	3	3	3	3	2
	Maximum number	2	2	2	2	2	2	3	—
	Minimum yield in face length	5/6	5/6	5/6	2/3	3/4	2/3	2/3	1/2
Maximum sweep and crook allowance (percent of gross volume)		15			30				50
Maximum cull and sweep allowance (percent of gross volume)		40 [3]			50 [4]				50

* End defects, although not visible in standing trees, are important in grading cut logs. Instructions for dealing with this factor are contained in Forest Prod. Lab. Rpt. D1737.

** A clear cutting is a portion of a face free of defects, extending the width of the face. A face is one-fourth the surface of the log as divided lengthwise.

[1] Ash and basswood butts can be 12 inches if otherwise meeting requirements for small No. 1's.

[2] Ten-inch logs of all species can be No. 2 if otherwise meeting requirements for small No. 1's.

[3] Otherwise No. 1 logs with 41 to 50 percent cull can be No. 2.

[4] Otherwise No. 2 logs with 51 to 60 percent cull can be No. 3.

HARDWOOD TIE-AND-TIMBER LOGS

Grade factors		*Specifications*
Position in tree		Butts and uppers
Scaling diameter (inches)		8+
Length, without trim (feet)		8+
Clear cuttings		No requirements. Not graded on cutting basis.
Max. sweep allowance		One-fourth d.i.b. of small end for half logs, and one-half d.i.b. for logs 16 feet long.
Sound surface defects permitted	Single knots	Any number, if none has an average collar* diameter that is more than one-third of log diameter at point of occurrence.
	Whorled knots	Any number, provided the sum of the collar diameters does not exceed one-third the log diameter at point of occurrence.
	Holes	Any number not exceeding knot specifications if they do not extend more than 3 inches into the contained tie or timber.
Unsound** surface defects permitted		Any number and size if they do not extend into contained tie or timber. If they extend into contained tie or timber, they shall not exceed size, number, and depth of limits for sound defects.

* Knot collar is the average of the vertical and horizontal diameters of the limb or knot swelling as measured flush with the surface of the log.

** Interior defects are not visible in standing trees. They are considered in grading cut logs. No interior defects are permitted except one shake not more than one-third the width of the contained tie or timber, and one split not more than 5 inches long.

Net Annual Growth and Timber Removals

Average net annual growth of growing stock.—The change (resulting from natural causes) in volume of sound wood in sawtimber and poletimber trees during the period between surveys, divided by the length of the period. (Components of net annual growth of growing stock include the increment in net volume of trees present at the beginning of the period and surviving to its end, plus net volume of trees reaching poletimber size during the period, minus the net volume of trees that died during the period, minus the net volume of trees that became rough or rotten trees during the period.)

Ingrowth of growing stock.—The net cubic-foot volume of trees

now classified as growing stock that were not tallied as such on the initial survey, divided by the length of the period between surveys.

Average annual mortality of growing stock.—The net cubic-foot volume removed from the growing stock through death from natural causes during the period between surveys, divided by the length of the period between surveys.

Average annual growing stock removals.—The net cubic-foot volume of live growing-stock trees harvested or killed in logging, cultural operations like timber-stand improvement, land clearing, or changes in land use during the period between surveys and converted to an annual basis.

Average net annual growth of sawtimber.—The change (resulting from natural causes) in net board-foot volume of sawtimber during the period between surveys, divided by the length of the period between surveys. (Components of net annual growth of sawtimber include the increment in net volume of sawtimber trees present at the beginning of the period and surviving to its end, plus the net volume of trees reaching sawtimber size during the period, minus the net volume of sawtimber trees that died during the period, minus the net volume of sawtimber trees that became rough or rotten during the period.)

Ingrowth of Sawtimber.—The net board-foot volume of trees now classed as sawtimber that were not tallied on the initial survey, divided by the length of the period between surveys.

Average annual mortality of sawtimber.—The net board-foot volume removed from live sawtimber through death from natural causes during the period between surveys, divided by the length of the period between surveys.

Average annual sawtimber removals.—The net board-foot volume of live sawtimber trees harvested or killed in logging, cultural operations like timber-stand improvement, land clearing, or changes in land use during the period between surveys and converted to an annual basis.

FOREST SURVEY METHODS

Hill Country forest area and timber volume estimates were obtained by combining the results of two independent inventories. One was based on the updating of the initial survey (1952). This procedure required the remeasurement of a subsample of the initial inventory ground plots. With the area-change and current volume estimates obtained from the remeasured sample plots, regression techniques were used to update all the initial ground and photo plots to obtain an estimate of current timber volume and forest area.

The second inventory was also based on a large photo-plot sample with a subsample of ground plots. For the second measurement, the most recent aerial photographs of the Hill Country were used. Photo plots were pinpointed on each photograph to provide a uniformly distributed sample of the area. Each photo plot was examined stereoscopically and classified as either forest or nonforest land. Those classified as forest plots were further stratified into cubic-foot-volume-per-acre classes. A subsample of

these photo plots, which was selected to be proportional to the area in a photo class, was measured on the ground. From this, ground measurement estimates of the mean and variance of each photo class were obtained. These means were expanded by the photo strata area to yield an independent estimate of forest area and timber volume.

The final estimates of current forest area and timber volume were developed by combining the two independent inventories. The combination process consisted of weighting each estimate by the reciprocal of its variance and then adding them. The associated sampling error for this new estimate was also obtained. These combined totals were partitioned into the various categories of area and volume (volume by species and d.b.h. class) using the data obtained from the new ground-plot sample.

In addition to estimating current timber volume and forest area, the forest survey of the Hill Country was designed to obtain an estimate of the components of change during the period between the initial and the current inventories. The parameters of interest include area change from forest to nonforest and vice versa, timber growth, timber removals, and timber mortality. All this information was obtained from the remeasured plots. The timber-change parameters were obtained by a tree-by-tree reconciliation of each remeasured plot. Using the reconciliation code for each remeasured tree, estimates of the parameters of change were made by species. The estimates of change were expressed as an annual figure by dividing the total for the period by the number of years between measurements.

Remeasured Phase

The initial forest inventory of the Hill Country consisted of a large photo-plot sample plus a ground measurement of a subsample of these photo plots. The photo plots were stratified according to land use as forest or nonforest. The forest plots were further classified into stand-size classes. Over 1,300 ground plots were measured by field crews during this first inventory. These ground samples were 1/5-acre circular radius plots.

For the remeasurement, a sample (selected randomly within each initial plot class), of 332 of the initial ground plots was revisited. These plots were distributed within the three geographic units as follows:

South-Central Unit	117
Southeastern Unit	106
East-Central Unit	109

The plot center was relocated for each remeasured plot. On those plots that were forested, all the trees on the 1/5-acre were tallied. The new tally was reconciled with the initial tally to account for every tree at both occasions.

New Ground Phase

The source of the new, independent estimates of volume and forest area was a new photo stratification with a subsample of ground measurements. The photo sample of the Hill Country consisted of 32,900 photo points on 1964-65 aerial photographs. A subset of 2,022 of these photo plots was located on the ground. Land use was verified and tree-measure-

ment data were recorded for the forest plots. Unlike the initial inventory, where fixed-radius 1/5-acre plots were tallied, the new ground plots consisted of a cluster of 10 prism points systematically covering approximately 1 acre. At each point trees were selected for tally, using a prism with a basal area factor of 37.5. Area attribute data were also tallied at each of the 10 points.

The 2,022 ground plots in the Hill Country were distributed within geographic strata as follows:

South-Central Unit	760
Southeastern Unit	495
East-Central Unit	767

County Data

In recent years users of forest-survey data have shown a need for county information. To provide such information within the framework of the survey design, county tables have been developed, based on a survey unit partitioning technique. First, the survey unit means and variances for the various photo-plot strata were applied to the photo-plot data for each county within the survey unit. This yielded an estimate of total volume or total commercial forest land area for each county. Next the data from the new ground plots were used to partition the county totals into their various components. For example, if a table of cubic-foot volume by species was to be made for a county, the estimate of total cubic-foot volume for that county was partitioned into species totals according to the species proportion for all new forest-survey ground plots within the unit.

Wayne National Forest

A separate inventory of the approximately 120,000 acres of forest land in the Wayne National Forest was conducted by the inventory staff of the National Forest Administration, Region 9. This inventory was designed to estimate current volume and commercial forest area, using the photo stratification of the most recent aerial photographs. The photo stratification was made only on the basis of forest-nonforest area. No attempt was made to estimate forest volume classes. A subsample of the photo plots was located and measured on the ground to estimate volume and area means and variances. These means were expanded by the photo stratification to obtain an estimate of total volume and area. The totals were partitioned, based on the measurement data from the ground sample plots.

Comparisons Between Inventories

A comparison of the 1967 and 1952 forest-survey estimates of volume, growth, removals, and mortality was made for the Hill Country of Ohio, using computer program TRAS (Timber Resource Analysis System). The estimates were found to be similar. But, because the survey unit boundaries were different for the first survey, the 1952 statistics for the South-Central Unit and for the Hill Country had to be adjusted to include data for Brown and Clermont Counties before they could be compared with 1967 statistics. Such adjustments have been made, where needed, in this report.

No adjustments are needed to compare trends in the Southeastern or East-Central Units. The procedure for obtaining county data (see *Forest Survey Methods)* does not make possible comparisons of inventory trends for counties.

RELIABILITY OF THE ESTIMATES

The forest-area and timber-volume data presented in this report are based on a carefully designed sample of forest conditions throughout the Hill Country. However, since neither every acre nor every tree in the region was measured, the figures in this report are estimates. A measure of the reliability of these estimates is given by a sampling error. Each estimate in this report had a computed sampling error. Included with the statistical tables are the corresponding sampling errors for row totals and column totals.

Briefly, here is how the sampling error indicates reliability. Our report of the total growing-stock volume in southeastern Ohio, 2,887 million cubic feet, has an associated sampling error of 1 percent (28.9 million cubic feet). This means that our best estimate of the total growing-stock volume in 1967 is 2,887 million cubic feet. If there are no errors in procedure, the odds are 2 to 1 that, if we repeated the resurvey in the same way, the new estimate of growing-stock volume would be between 2,858 million and 2,916 million cubic feet (2,887 $\pm$ 28.9). Similarly, the odds are 19 to 1 that it would be within $\pm$ 58 million cubic feet of the present estimate, and 300 to 1 that it would be within $\pm$ 87 million cubic feet.

The computed sampling error is not a complete measure of reliability; there are other sources of error that this term does not include. There could be imperfections in our volume tables and equations and errors in field measurement. Procedural errors were kept to a minimum by careful training of all personnel, frequent inspection of field work, and application of the most reliable survey methods.

Computed sampling errors for the totals shown in the statistical tables are:

	Sampling error (percent)
Commercial forest area	
4.4 million acres	1.3
Growing-stock volume	
2.9 billion cubic feet	1.3
Sawtimber volume	
9.8 billion board feet	1.7
Average net annual growth of growing stock	
103.8 million cubic feet	8.9
Average annual removals of growing stock	
41.6 million cubic feet	14.8

COMMON COMMERCIAL TREE SPECIES OF OHIO[5]

Softwoods

Common Name	Botanical Name
Eastern white pine	*Pinus strobus*
Red pine (Norway)	*P. resinosa*
Virginia pine	*P. virginiana*
Shortleaf pine	*P. echinata*
Pitch pine	*P. rigida*
Other softwoods:	
Eastern hemlock	*Tsuga canadensis*
Eastern redcedar	*Juniperus virginiana*
Northern white-cedar	*Thuja occidentalis*

Hardwoods

Select white oaks:	
White oak	*Quercus alba*
Swamp white oak	*Q. bicolor*
Swamp chestnut oak	*Q. michauxii*
Chinkapin oak	*Q. muehlenbergii*
Bur oak	*Q. macrocarpa*
Other white oaks:	
Chestnut oak	*Q. prinus*
Post oak	*Q. stellata var. stellata*
Select red oaks:	
Northern red oak	*Q. rubra*
Shumard oak	*Q. shumardii*
Other red oaks:	
Black oak	*Q. velutina*
Pin oak	*Q. palustris*
Scarlet oak	*Q. coccinea*
Shingle oak	*Q. imbricaria*
Southern red oak	*Q. falcata var falcata*
Hickory	*Carya* spp.
Hard maple:	
Sugar maple	*Acer saccharum*
Black maple	*A. nigrum*
Soft maple:	
Red maple	*A. rubrum*
Silver maple	*A. saccharinum*
Beech	*Fagus grandifolia*
White ash	*Fraxinus americana*

[5] Little, Elbert L., Jr. Checklist of Native and Naturalized Trees of the United States (Including Alaska). U. S. Dep. Agr., Agr. Handbook 41, 472 pp. 1953.

Other ash:	
Black ash	*F. nigra*
Green ash	*F. pennsylvanica*
Blue ash	*F. quadrangulata*
Quaking aspen	*Populus tremuloides*
Bigtooth aspen	*P. grandidentata*
Eastern cottonwood	*P. deltoides*
Swamp cottonwood	*P. heterophylla*
Basswood (American linden)	*Tilia americana*
White basswood (beetree linden)	*T. heterophylla*
Yellow-poplar	*Liriodendron tulipifera*
Black walnut	*Juglans nigra*
Black cherry	*Prunus serotina*
Sycamore (buttonwood)	*Platanus occidentalis*
Black locust	*Robinia pseudoacacia*
Elm	*Ulmus* spp.
Sassafras[6]	*Sassafras albidum*
Other hardwoods:	
Butternut	*Juglans cinerea*
American chestnut	*Castanea dentata*
Black willow	*Salix nigra*
Buckeye	*Aesculus* spp.
Common persimmon	*Diospyros virginiana*
Cucumbertree	*Magnolia acuminata*
Flowering dogwood (dogwood)	*Cornus florida*
Hackberry	*Celtis occidentalis*
Honey locust	*Gleditsia triacanthos*
Kentucky coffeetree	*Gymnocladus dioicus*
River birch (red)	*Betula nigra*
Sweet birch (black)	*B. lenta*
Sweetgum	*Liquidamber styraciflua*
Blackgum (black tupelo)	*Nyssa sylvatica*

STATISTICAL DATA

Table 1.—Area in the Hill Country of Ohio, by land classes and counties, 1967.

Table 2.—Area of commercial forest land in the Hill Country of Ohio, by ownership classes and counties, 1967.

Table 3.—Area of commecial forest land in the Hill Country of Ohio, by stand-size classes and counties, 1967.

Table 4.—Area of commercial forest land in the Hill Country of Ohio, by stocking-percent classes of acceptable trees and counties, 1967.

Table 5.—Area of commercial forest land in the Hill Country of Ohio, by forest types and counties, 1967.

[6] Sassafras is usually classed as a noncommercial species, but because of its widespread use for fencing in Ohio it has been classed as a commercial species.

Table 6.—Net volume of growing stock on commercial forest land in the Hill Country of Ohio, by tree-size classes and counties, 1967.

Table 7.—Net volume of growing stock on commercial forest land in the Hill Country of Ohio, by stand-size classes and counties, 1967.

Table 8.—Net volume of sawtimber on commercial forest land in the Hill Country of Ohio, by stand-size classes and counties, 1967.

Table 9.—Net volume of growing stock on commercial forest land in the Hill Country of Ohio, by species and counties, 1967.

Table 10.—Net volume of sawtimber on commercial forest land in the Hill Country of Ohio, by species and counties, 1967.

Table 11.—Area in the Hill Country of Ohio, by land classes and geographic units, 1967.

Table 12.—Area of commercial forest land in the Hill Country of Ohio, by ownership classes and geographic units, 1967.

Table 13.—Area of commercial forest land in the Hill Country of Ohio, by stand-size classes and geographic units, 1967.

Table 14.—Area of commercial forest land in the Hill Country of Ohio, by stand-volume classes and geographic units, 1967.

Table 15.—Area of commercial forest land in the Hill Country of Ohio, by stocking classes of growing-stock trees, and geographic units, 1967.

Table 16.—Area of commercial forest land in the Hill Country of Ohio, by stocking classes based on selected stand components, 1967.

Table 17.—Area of commercial forest land in the Hill Country of Ohio, by site classes and geographic units, 1967.

Table 18—Area of commercial forest land in the Hill Country of Ohio, by forest types and geographic units, 1967.

Table 19.—Number of growing-stock trees on commercial forest land in the Hill Country of Ohio, by diameter classes and species groups, 1967.

Table 20.—Net volume of timber on commercial forest land in the Hill Country of Ohio, by class of timber and geographic units, 1967.

Table 21.—Net volume of timber on commercial forest land in the Hill Country of Ohio, by class of timber and species groups, 1967.

Table 22.—Net volume of growing stock on commercial forest land in the Hill Country of Ohio, by ownership classes and geographic units, 1967.

Table 23.—Net volume of sawtimber on commercial forest land in the Hill Country of Ohio, by ownership classes and geographic units, 1967.

Table 24.—Net volume of growing stock on commercial forest land in the Hill Country of Ohio, by stand-size classes and geographic units, 1967.

Table 25.—Net volume of sawtimber on commercial forest land in the Hill Country of Ohio, by stand-size classes and geographic units, 1967.

Table 26.—Growing-stock volume in the South-Central Unit of Ohio, by species and diameter classes, 1967.
Table 27.—Growing-stock volume in the Southeastern Unit of Ohio, by species and diameter classes, 1967.
Table 28.—Growing-stock volume in the East-Central Unit of Ohio, by species and diameter classes, 1967.
Table 29.—Total growing-stock volume in the Hill Country of Ohio, by species and diameter classes, 1967.
Table 30.—Sawtimber volume in the South-Central Unit of Ohio, by species and diameter classes, 1967.
Table 31.—Sawtimber volume in the Southeastern Unit of Ohio, by species and diameter classes, 1967.
Table 32.—Sawtimber volume in the East-Central Unit of Ohio, by species and diameter classes, 1967.
Table 33.—Total sawtimber volume in the Hill Country of Ohio, by species and diameter classes, 1967.
Table 34.—Sampling errors for growing-stock and sawtimber volumes in the Hill Country of Ohio, by geographic units and species, 1967.
Table 35.—Sawtimber volume in the South-Central Unit of Ohio, by species and log quality classes, 1967.
Table 36.—Sawtimber volume in the Southeastern Unit of Ohio, by species and log quality classes, 1967.
Table 37.—Sawtimber volume in the East-Central Unit of Ohio, by species and log quality classes, 1967.
Table 38.—Total sawtimber volume in the Hill Country of Ohio, by species and log quality classes, 1967.
Table 39.—Net annual growth of growing stock on commercial forest land in the Hill Country of Ohio, by species and geographic units, 1966.
Table 40.—Timber removals from growing stock on commercial forest land in the Hill Country of Ohio, by species groups and geographic units, 1966.
Table 41.—Net annual growth of sawtimber on commercial forest land in the Hill Country of Ohio, by species and geographic units, 1966.
Table 42.—Timber removals from sawtimber on commercial forest land in the Hill Country of Ohio, by species groups and geographic units, 1966.

Table 1.—*Area in the Hill Country of Ohio, by land classes and counties, 1967*

County	Total land area[1]	Nonforest land area	Forest land area[2]			
			Non-commercial	Commercial		Sampling error
	Thousand acres	*Thousand acres*	*Thousand acres*	*Thousand acres*	*Percent*	*Percent*
SOUTH-CENTRAL UNIT						
Adams	375.9	188.8	0.2	186.9	50	6
Brown	313.9	237.1	—	76.8	24	12
Clermont	293.3	202.3	.8	90.2	31	9
Gallia	301.4	142.3	—	159.1	53	7
Highland	351.4	267.2	2.2	82.0	23	12
Jackson	267.9	126.3	.3	141.3	53	8
Lawrence	291.5	83.4	—	208.1	71	6
Pike	283.6	114.2	.9	168.5	59	6
Ross	439.6	269.3	1.0	169.3	39	7
Scioto	389.2	129.5	.2	259.5	67	5
Unit total	3,307.7	1,760.4	5.6	1,541.7	47	2
SOUTHEASTERN UNIT						
Athens	322.6	104.8	2.5	215.3	67	7
Hocking	269.4	71.0	1.6	196.8	73	6
Meigs	278.7	110.6	.6	167.5	60	7
Morgan	268.5	151.2	2.4	114.9	43	10
Perry	262.1	129.2	—	132.9	51	10
Vinton	262.7	66.8	1.7	194.2	74	6
Washington	410.2	159.1	—	251.1	61	6
Unit total	2,074.2	792.7	8.8	1,272.7	61	2
EAST-CENTRAL UNIT						
Belmont	342.0	183.7	1.6	156.7	46	9
Carroll	249.9	136.1	.7	113.1	45	11
Coshocton	359.6	211.2	.2	148.2	41	10
Guernsey	337.7	182.3	13.2	142.2	42	10
Harrison	256.6	117.9	1.3	137.4	54	11
Holmes	271.1	177.6	—	93.5	34	13
Jefferson	262.8	114.6	.9	147.3	56	9
Monroe	291.8	108.0	—	183.8	63	8
Muskingum	427.0	251.4	1.5	174.1	41	9
Noble	255.0	139.3	.9	114.8	45	12
Tuscarawas	364.2	207.9	.5	155.8	43	10
Unit total	3,417.7	1,830.0	20.8	1,566.9	46	3
Region total	8,799.6	4,383.1	35.2	4,381.3	50	1

[1] Land area from U. S. Bureau of the Census, Land and Water Areas of Ohio: 1960.
[2] There is no unproductive forest land in this region.

Table 2.—*Area of commercial forest land in the Hill Country of Ohio, by ownership classes and counties, 1967*

[In thousands of acres.]

County	Public-owned[1]		Private-owned		Total
	National forest	Other public[2]	Farmer-owned	Other private	
Adams	—	16.3	97.6	73.0	186.9
Athens	8.2	3.5	67.9	135.7	215.3
Belmont	—	2.6	50.3	103.8	156.7
Brown	—	.8	40.6	35.4	76.8
Carroll	—	3.1	46.9	63.1	113.1
Clermont	—	—	30.7	59.5	90.2
Coshocton	—	5.2	62.0	81.0	148.2
Gallia	4.5	.3	71.4	82.9	159.1
Guernsey	—	.8	61.6	79.8	142.2
Harrison	—	7.8	33.0	96.6	137.4
Highland	—	.9	42.0	39.1	82.0
Hocking	18.5	9.7	76.0	92.6	196.8
Holmes	—	—	61.1	32.4	93.5
Jackson	.4	6.2	36.2	98.5	141.3
Jefferson	—	3.6	44.2	99.5	147.3
Lawrence	38.9	1.8	57.7	109.7	208.1
Meigs	—	2.3	94.9	70.3	167.5
Monroe	4.3	1.1	72.0	106.4	183.8
Morgan	2.3	2.2	65.5	44.9	114.9
Muskingum	—	5.3	67.1	101.7	174.1
Noble	—	1.3	35.4	78.1	114.8
Perry	16.4	2.4	39.2	74.9	132.9
Pike	—	10.3	62.0	96.2	168.5
Ross	—	22.9	77.4	69.0	169.3
Scioto	5.2	54.4	54.9	145.0	259.5
Tuscarawas	—	1.4	54.0	100.4	155.8
Vinton	2.0	25.2	59.8	107.2	194.2
Washington	11.6	.2	111.6	127.7	251.1
All counties	112.3	191.6	1,673.0	2,404.4	4,381.3

[1] From ownership records.

[2] Includes 19,900 acres in the Muskingum Watershed Conservatory District within this region.

Table 3.—*Area of commercial forest land in the Hill Country of Ohio, by stand-size classes and counties, 1967*

[In thousands of acres]

County	Sawtimber stands	Poletimber stands	Sapling-seedling stands	Nonstocked areas	Total
Adams	52.8	27.3	104.7	2.1	186.9
Athens	68.2	25.6	114.4	7.1	215.3
Belmont	39.8	18.9	93.0	5.0	156.7
Brown	16.4	10.0	49.1	1.3	76.8
Carroll	24.7	12.1	73.2	3.1	113.1
Clermont	35.1	12.4	41.9	.8	90.2
Coshocton	37.0	16.4	88.9	5.9	148.2
Gallia	39.2	23.9	93.3	2.7	159.1
Guernsey	32.6	15.7	88.2	5.7	142.2
Harrison	19.6	12.0	99.3	6.5	137.4
Highland	23.1	11.2	46.5	1.2	82.0
Hocking	63.4	25.2	100.7	7.5	196.8
Holmes	28.6	11.4	50.1	3.4	93.5
Jackson	45.8	19.0	74.6	1.9	141.3
Jefferson	39.2	18.6	85.4	4.1	147.3
Lawrence	72.4	29.5	99.1	7.1	208.1
Meigs	56.9	19.8	86.3	4.5	167.5
Monroe	50.6	24.8	104.2	4.2	183.8
Morgan	27.1	12.8	71.6	3.4	114.9
Muskingum	42.5	21.8	104.6	5.2	174.1
Noble	18.7	11.0	80.3	4.8	114.8
Perry	37.5	14.4	75.0	6.0	132.9
Pike	59.2	26.1	81.9	1.3	168.5
Ross	61.9	24.7	81.4	1.3	169.3
Scioto	88.8	41.2	126.4	3.1	259.5
Tuscarawas	34.0	16.8	99.6	5.4	155.8
Vinton	68.7	24.9	95.8	4.8	194.2
Washington	75.4	30.9	136.9	7.9	251.1
All counties	1,259.2	558.4	2,446.4	117.3	4,381.3

Table 4.—*Area of commercial forest land in the Hill Country of Ohio, by stocking-percent classes of acceptable trees and counties, 1967*

[In thousands of acres]

County	Acceptable-tree stocking class [1]			Total
	Over 70 percent	40 to 70 percent	Under 40 percent	
Adams	117.5	53.8	15.6	186.9
Athens	121.3	64.0	30.0	215.3
Belmont	63.8	65.3	27.6	156.7
Brown	43.2	24.5	9.1	76.8
Carroll	44.6	49.0	19.5	113.1
Clermont	61.7	22.9	5.6	90.2
Coshocton	59.7	60.3	28.2	148.2
Gallia	95.2	48.1	15.8	159.1
Guernsey	56.0	58.6	27.6	142.2
Harrison	47.5	59.1	30.8	137.4
Highland	50.1	24.0	7.9	82.0
Hocking	110.0	61.2	25.6	196.8
Holmes	41.6	36.4	15.5	93.5
Jackson	91.7	37.2	12.4	141.3
Jefferson	60.6	61.3	25.4	147.3
Lawrence	118.8	64.2	25.1	208.1
Meigs	99.5	47.3	20.7	167.5
Monroe	75.8	77.5	30.5	183.8
Morgan	60.4	37.0	17.5	114.9
Muskingum	71.5	72.8	29.8	174.1
Noble	40.7	50.0	24.1	114.8
Perry	65.5	42.3	25.1	132.9
Pike	114.2	44.8	9.5	168.5
Ross	114.5	44.9	9.9	169.3
Scioto	173.8	69.6	16.1	259.5
Tuscarawas	60.6	66.2	29.0	155.8
Vinton	119.5	56.0	18.7	194.2
Washington	141.3	77.3	32.5	251.1
All counties	2,320.6	1,475.6	585.1	4,381.3

[1] Acceptable trees make up about 94 percent of the number of growing-stock trees. Desirable trees were not included in this table.

Table 5.—*Area of commercial forest land in the Hill Country of Ohio, by forest types and counties, 1967*

[In thousands of acres]

County	White-red pine[1]	Virginia-shortleaf pine	Oak-pine	Oak-hickory	Oak-gum	Elm-ash-cottonwood	Maple-beech-birch	Aspen-birch	Total
Adams	1.2	14.1	13.9	108.0	1.2	26.3	21.8	0.4	186.9
Athens	.8	10.2	13.4	127.8	2.5	25.3	34.3	1.0	215.3
Belmont	3.5	1.3	10.8	60.0	.4	45.7	31.1	3.9	156.7
Brown	.5	.6	6.4	47.9	.7	10.8	9.7	.2	76.8
Carroll	2.2	.7	8.3	45.3	.1	33.0	20.1	3.4	113.1
Clermont	.3	.2	6.1	61.3	.5	10.0	11.7	.1	90.2
Coshocton	3.8	1.3	11.3	55.3	.5	43.0	30.0	3.0	148.2
Gallia	1.0	15.0	12.0	89.2	.9	22.4	17.8	.8	159.1
Guernsey	3.8	1.0	9.7	53.0	.6	42.1	28.8	3.2	142.2
Harrison	4.8	.5	11.5	49.5	.8	41.0	25.9	3.4	137.4
Highland	.4	5.9	6.5	47.4	.7	10.4	10.5	.2	82.0
Hocking	1.3	9.5	10.5	122.3	1.8	21.5	28.3	1.6	196.8
Holmes	1.7	.8	6.3	36.8	.1	27.3	18.6	1.9	93.5
Jackson	.6	12.3	11.1	82.2	1.3	17.0	16.6	.2	141.3
Jefferson	3.1	.9	9.7	57.3	.3	42.6	29.7	3.7	147.3
Lawrence	2.3	23.9	13.0	119.9	.7	25.3	20.4	2.6	208.1
Meigs	.4	6.8	9.6	100.5	1.7	19.5	28.6	.4	167.5
Monroe	3.7	1.8	11.1	74.4	.2	52.1	35.3	5.2	183.8
Morgan	.6	5.0	8.2	66.3	1.5	15.7	17.0	.6	114.9
Muskingum	3.6	1.6	11.9	67.9	.3	51.4	32.8	4.6	174.1
Noble	3.5	.8	9.7	41.5	.6	34.0	21.7	3.0	114.8
Perry	1.1	8.1	9.3	75.6	1.6	17.5	18.4	1.3	132.9
Pike	.6	9.8	12.0	103.6	.8	21.1	20.2	.4	168.5
Ross	.6	10.0	11.4	104.1	.7	20.5	21.7	.3	169.3
Scioto	1.2	14.4	17.7	161.1	1.0	33.1	30.0	1.0	259.5
Tuscarawas	3.8	1.0	12.6	59.2	.4	45.5	29.3	4.0	155.8
Vinton	.6	6.7	9.2	122.7	1.6	20.4	32.4	.6	194.2
Washington	1.3	10.7	14.5	153.0	2.5	29.5	38.2	1.4	251.1
All counties	52.3	174.9	297.7	2,293.1	26.0	804.0	680.9	52.4	4,381.3

[1] Includes 9,200 acres in spruce plantations.

Table 6.—*Net volume of growing stock on commercial forest land in the Hill Country of Ohio, by tree-size classes and counties, 1967*

[In millions of cubic feet]

County	Sawtimber trees	Poletimber trees	Total growing stock
Adams	79.6	50.9	130.5
Athens	93.8	50.3	144.1
Belmont	56.4	35.4	91.8
Brown	25.7	18.5	44.2
Carroll	38.0	25.4	63.4
Clermont	48.0	26.3	74.3
Coshocton	52.4	32.6	85.0
Gallia	62.6	42.5	105.1
Guernsey	47.7	30.4	78.1
Harrison	35.9	25.7	61.6
Highland	33.7	21.3	55.0
Hocking	87.5	48.7	136.2
Holmes	37.8	22.6	60.4
Jackson	65.4	38.5	103.9
Jefferson	54.3	34.0	88.3
Lawrence	102.8	59.4	162.2
Meigs	76.4	39.8	116.2
Monroe	70.0	44.1	114.1
Morgan	40.5	24.3	64.8
Muskingum	62.2	40.0	102.2
Noble	32.6	22.4	55.0
Perry	52.3	29.2	81.5
Pike	84.5	49.7	134.2
Ross	86.7	49.6	136.3
Scioto	129.6	77.1	206.7
Tuscarawas	51.6	33.7	85.3
Vinton	92.5	49.0	141.5
Washington	105.5	59.4	164.9
All counties	1,806.0	1,080.8	2,886.8

Table 7.—*Net volume of growing stock on commercial forest land in the Hill Country of Ohio, by stand-size classes and counties, 1967*

[In millions of cubic feet]

County	Sawtimber stands	Poletimber stands	Other stands [1]	Total	Sampling error [2]
					Percent
Adams	66.5	26.0	38.0	130.5	8
Athens	84.1	21.8	38.2	144.1	9
Belmont	47.3	16.8	27.7	91.8	11
Brown	19.3	9.5	15.4	44.2	15
Carroll	30.4	11.7	21.3	63.4	15
Clermont	45.3	12.9	16.1	74.3	11
Coshocton	43.8	15.2	26.0	85.0	12
Gallia	48.9	22.2	34.0	105.1	11
Guernsey	39.7	14.1	24.3	78.1	13
Harrison	25.8	11.1	24.7	61.6	16
Highland	28.1	10.9	16.0	55.0	14
Hocking	77.0	21.4	37.8	136.2	9
Holmes	34.1	11.0	15.3	60.4	15
Jackson	59.0	19.0	25.9	103.9	10
Jefferson	46.0	16.5	25.8	88.3	12
Lawrence	94.6	27.1	40.5	162.2	9
Meigs	70.6	16.9	28.7	116.2	9
Monroe	59.3	21.7	33.1	114.1	12
Morgan	31.8	10.8	22.2	64.8	12
Muskingum	50.8	19.6	31.8	102.2	11
Noble	23.8	9.9	21.3	55.0	16
Perry	46.1	11.9	23.5	81.5	13
Pike	75.2	25.2	33.8	134.2	9
Ross	79.2	24.9	32.2	136.3	9
Scioto	113.3	39.9	53.5	206.7	7
Tuscarawas	41.2	15.5	28.6	85.3	13
Vinton	84.4	21.2	35.9	141.5	8
Washington	90.9	26.1	47.9	164.9	8
All counties	1,556.5	510.8	819.5	2,886.8	1

[1] Volume is mostly in sapling-seedling stands. Volume in nonstocked areas amounts to 9.7 million cubic feet (1 percent of this class).

[2] Sampling error for total.

Table 8.—*Net volume of sawtimber on commercial forest land in the Hill Country of Ohio, by stand-size classes and counties, 1967*

[In millions of board feet]

County	Sawtimber stands	Poletimber stands	Other stands [1]	Total	Sampling error [2]
					Percent
Adams	260.0	57.4	105.7	423.1	10
Athens	344.2	46.7	114.9	505.8	11
Belmont	197.4	36.2	84.2	317.8	14
Brown	76.6	20.9	40.8	138.3	20
Carroll	124.9	24.6	63.6	213.1	19
Clermont	177.8	28.5	47.9	254.2	13
Coshocton	185.7	32.6	77.1	295.4	15
Gallia	192.6	48.9	92.5	334.0	14
Guernsey	165.9	29.9	72.9	268.7	10
Harrison	106.6	22.5	73.0	202.1	20
Highland	110.9	24.0	44.7	179.6	18
Hocking	310.9	45.6	113.8	470.3	12
Holmes	141.3	23.8	47.8	212.9	18
Jackson	231.3	42.1	73.8	347.2	12
Jefferson	191.7	35.7	78.5	305.9	15
Lawrence	372.8	58.7	113.2	544.7	11
Meigs	287.2	36.5	86.7	410.4	12
Monroe	246.2	47.3	99.9	393.4	14
Morgan	129.8	23.9	67.0	220.7	15
Muskingum	211.1	42.5	96.4	350.0	9
Noble	98.9	20.3	64.2	183.4	21
Perry	187.4	25.3	69.6	282.3	16
Pike	293.8	55.8	98.3	447.9	11
Ross	310.8	55.2	93.2	459.2	12
Scioto	444.2	87.7	153.8	685.7	9
Tuscarawas	170.5	32.9	87.0	290.4	16
Vinton	340.9	46.1	108.2	495.2	10
Washington	367.4	56.5	144.3	568.2	10
All counties	6,278.8	1,108.1	2,413.0	9,799.9	2

[1] Volume is mostly in sapling-seedling stands. Volume in nonstocked areas amounts to 29.4 million board feet (1 percent of this class).

[2] Sampling error for total.

Table 9.—*Net volume of growing stock on commercial forest land in the Hill Country of Ohio, by species and counties, 1967*

[In millions of cubic feet]

Species	Adams	Athens	Belmont	Brown	Carroll	Clermont	Coshocton
White pine [1]	0.1	1.0	1.8	—	1.3	—	1.7
Yellow pine [2]	6.1	3.3	.4	—	.2	—	.3
Other softwoods [3]	.4	.3	.7	0.2	.4	0.1	.6
Total softwoods	6.6	4.6	2.9	0.2	1.9	0.1	2.6
Select white oaks	21.7	26.6	10.1	6.8	7.2	11.9	9.6
Select red oaks	7.8	11.4	6.3	2.8	4.3	5.0	5.9
Chestnut oak [4]	16.0	11.7	2.2	4.5	1.5	11.3	1.9
Other red oaks	16.0	20.9	8.6	7.5	6.3	13.4	8.0
Hickory	15.7	14.7	8.3	5.2	6.0	8.3	7.8
Sugar maple	6.3	6.4	3.7	1.9	2.6	3.2	3.5
Soft maples	3.3	3.3	4.4	1.3	3.2	1.8	4.2
Beech	1.7	4.3	4.0	.5	2.6	1.2	3.8
White ash [5]	6.6	4.8	4.4	2.1	2.8	3.8	3.8
Aspen [6]	.7	1.4	2.1	.3	1.6	.3	1.8
Basswood	.7	.9	.6	.3	.5	.5	.6
Yellow-poplar	8.2	14.6	9.0	3.0	5.8	4.6	8.7
Black walnut	3.0	3.2	2.7	1.3	2.1	1.2	2.4
Black cherry	1.7	1.7	5.5	.7	3.7	.7	4.9
Sycamore	3.2	2.8	1.2	1.4	.6	1.4	.9
Black locust	1.4	.9	2.3	.7	1.5	.6	2.0
Elm	3.3	5.2	10.6	1.2	7.1	1.5	9.9
Sassafras	1.9	.6	.7	.8	.5	.9	.7
Other hardwoods	4.7	4.1	2.2	1.7	1.6	2.6	2.0
Total hardwoods	123.9	139.5	88.9	44.0	61.5	74.2	82.4
All species	130.5	144.1	91.8	44.2	63.4	74.3	85.0

Species	Gallia	Guernsey	Harrison	Highland	Hocking	Holmes	Jackson
White pine [1]	0.1	1.7	1.6	—	1.1	0.9	0.1
Yellow pines [2]	6.5	.3	.3	2.4	3.7	.3	5.9
Other softwoods [3]	.3	.6	.4	.1	.2	.4	.2
Total softwoods	6.9	2.6	2.3	2.5	5.0	1.6	6.2
Select white oaks	17.6	8.5	6.3	8.8	24.8	7.2	16.8
Select red oaks	6.3	5.3	3.8	3.5	10.5	4.4	6.7
Chestnut oak [4]	11.7	1.8	1.4	6.8	11.9	1.4	14.5
Other red oaks	11.4	7.4	6.1	7.0	19.4	5.7	12.3
Hickory	12.7	7.1	5.6	6.4	14.2	5.7	11.9
Sugar maple	4.5	3.1	2.2	2.3	5.7	2.7	4.7
Soft maples	2.6	3.7	2.7	1.5	3.3	3.2	2.5

CONTINUED

Table 9—*Continued*

Species	Gallia	Guernsey	Harrison	Highland	Hocking	Holmes	Jackson
Beech	1.3	3.4	2.1	.7	3.5	2.9	1.5
White ash [5]	5.0	3.7	2.8	2.7	4.6	2.7	5.4
Aspen [6]	.7	1.8	1.6	.3	1.7	1.2	.4
Basswood	.6	.5	.4	.3	.8	.6	.6
Yellow-poplar	7.2	7.7	7.1	3.7	14.3	5.2	6.5
Black walnut	2.5	2.3	2.1	1.3	2.6	1.6	2.2
Black cherry	1.5	4.6	3.5	.8	1.6	3.5	1.1
Sycamore	2.7	.9	.6	1.4	2.5	.6	2.3
Black locust	1.3	2.0	1.6	.7	.7	1.2	1.0
Elm	2.9	9.2	7.3	1.4	4.6	7.1	2.4
Sassafras	1.8	.6	.5	.9	.6	.5	1.3
Other hardwoods	3.9	1.9	1.6	2.0	3.9	1.4	3.6
Total hardwoods	98.2	75.5	59.3	52.5	131.2	58.8	97.7
All species	105.1	78.1	61.6	55.0	136.2	60.4	103.9

Species	Jefferson	Lawrence	Meigs	Monroe	Morgan	Muskingum	Noble
White pine [1]	1.8	0.4	0.7	2.3	0.7	2.1	1.3
Yellow pines [2]	.5	10.4	2.1	.9	1.5	.5	.3
Other softwoods [3]	.5	.3	.2	.6	.2	.6	.4
Total softwoods	2.8	11.1	3.0	3.8	2.4	3.2	2.0
Select white oaks	9.8	27.9	21.7	13.0	10.8	11.3	5.6
Select red oaks	6.1	9.8	9.2	7.9	4.8	6.9	3.4
Chestnut oak [4]	2.1	21.3	10.4	3.1	4.7	2.4	1.3
Other red oaks	8.4	21.3	16.7	10.9	8.5	9.6	5.2
Hickory	8.0	18.8	11.8	10.3	6.7	9.2	4.9
Sugar maple	3.6	6.3	5.4	4.6	2.8	4.2	2.0
Soft maples	4.2	3.6	2.7	5.3	1.6	4.8	2.4
Beech	3.9	2.3	3.6	4.8	1.6	4.3	2.0
White ash [5]	4.3	7.1	3.7	5.5	2.5	4.9	2.6
Aspen [6]	2.0	1.2	1.1	2.6	1.0	2.3	1.4
Basswood	.5	.9	.7	.6	.4	.8	.3
Yellow-poplar	8.7	11.9	11.1	11.2	6.9	10.0	6.4
Black walnut	2.5	2.7	2.4	3.4	2.3	3.3	1.9
Black cherry	5.3	1.7	1.4	6.6	.8	6.1	3.2
Sycamore	1.0	3.0	2.4	1.3	1.7	1.0	.6
Black locust	2.3	1.3	.9	3.0	.5	2.8	1.5
Elm	10.0	3.4	4.3	12.5	2.6	11.8	6.5
Sassafras	.7	1.8	.6	1.0	.3	.8	.4
Other hardwoods	2.1	4.8	3.1	2.7	1.9	2.5	1.4
Total hardwoods	85.5	151.1	113.2	110.3	62.4	99.0	53.0
All species	88.3	162.2	116.2	114.1	64.8	102.2	55.0

CONTINUED

Table 9—*Continued*

Species	Perry	Pike	Ross	Scioto	Tuscarawas	Vinton	Washington
White pine [1]	0.8	0.1	0.1	0.2	1.8	0.8	1.2
Yellow pines [2]	2.5	5.4	5.4	8.2	.4	2.6	3.9
Other softwoods [3]	.2	.3	.4	.4	.5	.2	.4
Total softwoods	3.5	5.8	5.9	8.8	2.7	3.6	5.5
Select white oaks	14.4	23.1	22.2	35.5	9.3	26.3	29.5
Select red oaks	6.0	8.1	9.0	13.0	5.7	11.0	12.5
Chestnut oak [4]	6.8	18.2	19.6	27.3	1.9	13.1	14.2
Other red oaks	12.0	17.2	18.6	27.3	8.1	20.3	22.9
Hickory	8.3	16.2	15.6	24.7	7.8	14.8	17.4
Sugar maple	3.1	6.7	6.2	9.6	3.4	6.6	7.2
Soft maples	1.8	3.4	3.4	5.2	4.0	3.4	4.0
Beech	2.1	1.8	1.9	2.9	3.5	4.1	4.4
White ash [5]	2.7	7.0	7.0	10.4	3.9	4.5	5.8
Aspen [6]	1.1	.6	.6	.8	2.0	1.3	2.0
Basswood	.6	.7	.9	1.0	.6	.8	.9
Yellow-poplar	8.5	7.9	8.5	13.2	9.1	13.8	17.2
Black walnut	2.1	2.5	2.3	3.6	2.7	2.5	3.7
Black cherry	.9	1.5	1.4	2.3	5.0	1.7	2.0
Sycamore	1.7	2.7	2.8	4.0	.9	2.7	3.4
Black locust	.4	1.2	1.2	1.9	2.1	1.0	1.0
Elm	2.9	3.1	2.9	5.0	9.8	5.3	6.1
Sassafras	.4	1.9	1.6	3.0	.7	.8	.8
Other hardwoods	2.2	4.6	4.7	7.2	2.1	3.9	4.4
Total hardwoods	78.0	128.4	130.4	197.9	82.6	137.9	159.4
All species	81.5	134.2	136.3	206.7	85.3	141.5	164.9

[1] Includes a small amount of red pine.
[2] Includes Virginia, shortleaf, and pitch pine.
[3] Includes hemlock and eastern redcedar.
[4] Includes other white oaks.
[5] Includes other ash.
[6] Includes cottonwood.

Table 10.—*Net volume of sawtimber on commercial forest land in the Hill Country of Ohio, by species and counties, 1967*

[In millions of board feet]

Species	Adams	Athens	Belmont	Brown	Carroll	Clermont	Coshocton
White pine[1]	—	1.8	4.4	—	2.5	—	3.5
Yellow pines[2]	20.9	11.7	.1	—	.1	—	.1
Other softwoods[3]	1.4	.2	2.9	0.7	2.0	0.5	2.8
Total softwoods	22.3	13.7	7.4	0.7	4.6	0.5	6.4
Select white oaks	78.4	99.7	39.9	24.3	27.5	44.2	37.7
Select red oaks	30.6	46.8	25.5	10.6	16.1	21.6	23.6
Chestnut oak[4]	51.4	38.9	8.6	13.9	6.1	36.2	7.5
Other red oaks	60.3	89.4	34.4	26.0	24.9	52.6	32.3
Hickory	39.1	35.2	26.4	12.4	18.6	20.9	24.2
Sugar maple	17.1	19.6	12.6	4.9	7.4	9.3	11.4
Soft maples	10.1	8.1	13.8	4.5	9.6	5.6	13.2
Beech	9.1	22.8	22.9	2.7	14.0	6.4	21.7
White ash[5]	19.4	13.6	14.8	5.9	9.3	11.8	12.8
Aspen[6]	1.9	2.4	3.9	.7	3.1	.8	3.7
Basswood	2.5	3.4	3.1	.9	2.0	2.0	2.9
Yellow-poplar	34.1	57.2	37.6	12.4	23.7	19.7	36.9
Black walnut	8.3	11.6	7.1	3.6	5.5	3.2	6.5
Black cherry	4.3	4.7	13.2	2.1	8.9	1.9	12.1
Sycamore	12.5	10.6	4.9	4.9	3.0	5.6	4.3
Black locust	1.1	1.9	3.3	.4	2.2	.4	2.6
Elm	7.1	13.6	30.2	2.4	20.5	3.2	28.0
Sassafras	1.7	.8	.5	.6	.3	.7	.6
Other hardwoods	11.8	11.8	7.7	4.4	5.8	7.6	7.0
Total hardwoods	400.8	492.1	310.4	137.6	208.5	253.7	289.0
All species	423.1	505.8	317.8	138.3	213.1	254.2	295.4

Species	Gallia	Guernsey	Harrison	Highland	Hocking	Holmes	Jackson
White pine[1]	—	3.5	2.4	—	1.8	2.4	—
Yellow pines[2]	21.5	.1	.1	8.2	13.1	.1	20.8
Other softwoods[3]	1.1	2.6	1.9	.5	.2	2.0	.9
Total softwoods	22.6	6.2	4.4	8.7	15.1	4.5	21.7
Select white oaks	61.6	33.7	24.4	32.0	92.2	28.2	62.2
Select red oaks	24.9	21.5	14.8	14.5	42.9	17.5	27.2
Chestnut oak[4]	35.9	7.3	6.1	21.1	39.1	5.0	46.9
Other red oaks	43.1	29.3	23.0	26.4	81.4	23.6	49.3
Hickory	31.0	22.4	17.3	16.0	33.7	17.6	30.2
Sugar maple	12.3	10.6	6.7	6.5	17.6	8.5	13.4

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Table 10—*Continued*

Species	Gallia	Guernsey	Harrison	Highland	Hocking	Holmes	Jackson
Soft maples	8.1	11.8	8.5	5.1	7.6	10.0	7.4
Beech	6.8	19.3	11.9	4.0	18.4	16.6	8.2
White ash [5]	14.4	12.3	8.9	8.0	12.3	9.2	16.2
Aspen [6]	1.3	3.4	2.8	.5	2.3	2.6	1.3
Basswood	2.0	2.7	1.7	1.2	3.0	2.7	2.4
Yellow-poplar	29.8	31.5	28.6	15.2	56.7	22.3	26.8
Black walnut	6.9	5.9	4.7	3.4	9.5	4.8	5.9
Black cherry	3.8	11.0	7.6	2.2	4.4	9.3	2.8
Sycamore	10.4	4.1	2.9	5.0	9.8	3.0	8.8
Black locust	1.2	2.7	2.1	.5	1.5	1.8	.7
Elm	6.1	26.0	20.0	2.9	11.2	20.2	5.0
Sassafras	1.5	.5	.4	.7	1.0	.4	1.1
Other hardwoods	10.3	6.5	5.3	5.7	10.6	5.1	9.7
Total hardwoods	311.4	262.5	197.7	170.9	455.2	208.4	325.5
All species	334.0	268.7	202.1	179.6	470.3	212.9	347.2

Species	Jefferson	Lawrence	Meigs	Monroe	Morgan	Muskingum	Noble
White pine [1]	4.5	—	1.2	6.2	1.0	5.3	2.4
Yellow pines [2]	.2	35.4	7.4	1.0	4.8	.2	.1
Other softwoods [3]	2.6	1.1	.2	2.9	.2	2.7	1.7
Total softwoods	7.3	36.5	8.8	10.1	6.0	8.2	4.2
Select white oaks	38.7	101.6	82.4	50.8	41.0	44.0	21.7
Select red oaks	24.8	42.2	37.9	31.6	20.2	27.5	13.5
Chestnut oak [4]	8.3	70.1	34.5	12.4	15.6	9.5	5.4
Other red oaks	33.4	87.4	72.0	45.4	34.9	38.5	20.0
Hickory	25.3	44.9	29.7	32.2	16.6	29.1	15.5
Sugar maple	12.2	17.4	16.1	15.2	9.5	13.6	6.5
Soft maples	13.1	9.7	6.2	15.7	3.4	14.7	7.6
Beech	22.2	11.6	18.5	27.1	8.1	24.1	11.2
White ash [5]	14.3	20.8	10.9	18.4	7.1	16.4	8.3
Aspen [6]	3.7	2.0	1.8	4.6	1.4	4.2	2.4
Basswood	2.7	2.9	2.7	3.0	1.6	3.8	1.6
Yellow-poplar	36.3	49.8	44.2	46.3	25.7	41.0	26.2
Black walnut	6.6	7.9	8.8	8.7	8.4	8.4	4.4
Black cherry	12.7	4.5	3.9	16.1	2.3	14.8	7.0
Sycamore	4.8	12.0	9.0	6.1	6.2	5.4	2.7
Black locust	3.2	1.1	1.6	4.4	.8	4.0	2.0
Elm	28.4	7.5	11.8	35.2	6.4	33.7	18.2
Sassafras	.5	1.8	.6	.6	.4	.5	.4
Other hardwoods	7.4	13.0	9.0	9.5	5.1	8.6	4.6
Total hardwoods	298.6	508.2	401.6	383.3	214.7	341.8	179.2
All species	305.9	544.7	410.4	393.4	220.7	350.0	183.4

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Table 10—*Continued*

Species	Perry	Pike	Ross	Scioto	Tuscarawas	Vinton	Washington
White pine [1]	1.1	—	—	—	3.7	1.5	2.2
Yellow pines [2]	8.1	21.0	20.2	31.2	.1	9.5	13.2
Other softwoods [3]	.1	1.0	1.0	1.2	2.7	.2	.3
Total softwoods	9.3	22.0	21.2	32.4	6.5	11.2	15.7
Select white oaks	54.2	84.7	81.8	128.0	36.1	99.7	110.7
Select red oaks	25.3	32.7	37.6	52.9	22.2	45.7	52.0
Chestnut oak [4]	23.1	59.7	62.7	87.9	8.0	43.6	46.6
Other red oaks	51.0	65.8	72.8	104.4	32.2	84.9	95.1
Hickory	19.9	41.7	39.0	62.5	24.3	36.8	42.2
Sugar maple	10.2	18.7	17.3	26.6	10.6	19.5	22.5
Soft maples	4.2	9.8	10.5	14.7	12.6	7.5	9.1
Beech	10.6	10.1	11.1	15.7	19.5	20.9	22.0
White ash [5]	7.7	21.3	21.4	31.6	13.0	13.1	16.0
Aspen [6]	1.5	1.7	1.5	2.1	3.8	2.1	2.9
Basswood	1.7	2.7	3.4	4.5	2.9	3.1	3.6
Yellow-poplar	33.4	33.6	35.5	54.7	37.4	54.7	66.2
Black walnut	7.5	6.9	6.3	9.9	6.8	9.2	13.7
Black cherry	2.6	3.8	3.8	5.8	11.8	4.7	5.5
Sycamore	5.9	11.1	11.2	16.9	4.2	11.3	13.6
Black locust	.9	1.1	.9	1.9	3.0	1.8	2.0
Elm	6.9	7.2	6.5	11.1	27.7	13.8	15.1
Sassafras	.5	1.6	1.4	2.5	.5	.8	1.1
Other hardwoods	5.9	11.7	13.3	19.6	7.3	10.8	12.6
Total hardwoods	273.0	425.9	438.0	653.3	283.9	484.0	552.5
All species	282.3	447.9	459.2	685.7	290.4	495.2	568.2

[1] Includes a small amount of red pine.
[2] Includes Virginia, shortleaf, and pitch pine.
[3] Includes hemlock and eastern redcedar.
[4] Includes other white oaks.
[5] Includes other ash.
[6] Includes cottonwood.

Table 11.—*Area in the Hill Country of Ohio, by land classes and geographic units, 1967*

[In thousands of acres]

Land class	South-Central	South-eastern	East-Central	Total
Forest land:				
Commercial	1,541.7	1,272.7	1,566.9	4,381.3
Productive-reserved	5.6	8.8	20.8	35.2
Total [1]	1,547.3	1,281.5	1,587.7	4,416.5
Nonforest land	1,760.4	792.7	1,830.0	4,383.1
Total area [2]	3,307.7	2,074.2	3,417.7	8,799.6
	Sampling errors, in percent			
Commercial forest land	1.9	2.2	2.6	1.3

[1] There is no unproductive forest land in these units.
[2] Land area from U. S. Bureau of the Census, Land and Water Area of Ohio: 1960.

Table 12.—*Area of commercial forest land in the Hill Country of Ohio, by ownership classes and geographic units, 1967*

[In thousands of acres]

Ownership class	South-Central	South-eastern	East-Central	Total
National forest	49.0	59.0	4.3	112.3
Other public	113.9	45.5	32.2	191.6
Total public	162.9	104.5	36.5	303.9
Pulp and paper industry	60.7	37.6	—	98.3
Lumber industry	5.7	3.7	8.2	17.6
Other forest industry	3.4	3.6	3.9	10.9
Total forest industry	69.8	44.9	12.1	126.8
Farmer-owned	570.5	514.9	587.6	1,673.0
Miscellaneous private	738.5	608.4	930.7	2,277.6
All ownerships	1,541.7	1,272.7	1,566.9	4,381.3
	Sampling errors, in percent [1]			
Forest industry	20	27	58	16
Farmer-owned	6	7	7	4
Miscellaneous private	5	6	5	3

[1] There are no sampling errors for public ownership. Areas were obtained from public records.

Table 13.—*Area of commercial forest land in the Hill Country of Ohio, by stand-size classes and geographic units, 1967*

[In thousands of acres]

Stand-size class	South-Central	South-eastern	East-Central	Total
Sawtimber stands	494.7	397.2	367.3	1,259.2
Poletimber stands	225.3	153.6	179.5	558.4
Sapling-seedling stands	798.9	680.7	966.8	2,446.4
Nonstocked areas	22.8	41.2	53.3	117.3
All classes	1,541.7	1,272.7	1,566.9	4,381.3
	Sampling errors, in percent			
Sawtimber stands	6	7	8	4
Poletimber stands	11	14	14	8
Sapling-seedling stands	5	5	5	3
Nonstocked areas	37	29	32	19

Table 14.—*Area of commercial forest land in the Hill Country of Ohio by stand-volume classes and geographic units, 1967*

[In thousands of acres]

Stand volume [1] per acre	South-Central	South-eastern	East-Central	Total
Less than 1,500 board feet	641.5	574.1	877.0	2,092.6
1,500 to 5,000 board feet	638.0	519.4	544.0	1,701.4
More than 5,000 board feet	262.2	179.2	145.9	587.3
All classes	1,541.7	1,272.7	1,566.9	4,381.3

[1] Net volume, International ¼-inch rule.

Table 15.—*Area of commercial forest land in the Hill Country of Ohio, by stocking classes of growing-stock trees, and geographic units, 1967*

[In thousands of acres]

Stocking percentage class	South-Central	South-eastern	East-Central	Total
Overstocked	36.3	14.2	22.7	73.2
100 to 129	347.0	267.6	203.6	818.2
90 to 99	143.6	165.9	165.1	474.6
80 to 89	257.4	171.6	151.2	580.2
70 to 79	219.3	168.5	197.4	585.2
60 to 69	194.6	135.7	235.1	565.4
50 to 59	131.2	121.6	202.6	455.4
40 to 49	85.5	77.0	136.7	299.2
30 to 39	69.8	75.1	115.4	260.3
20 to 29	36.8	37.2	77.3	151.3
10 to 19	13.4	21.5	39.3	74.2
Less than 10	6.8	16.8	20.5	44.1
All classes	1,541.7	1,272.7	1,566.9	4,381.3

Table 16.—Area of commercial forest land in the Hill Country of Ohio, *by stocking classes based on selected stand components, 1967*

[In thousands of acres]

Stocking percentage class	Stocking classified in terms of —			
	All trees	Growing-stock trees	Desirable trees	Acceptable trees
Overstocked	875.1	73.2	4.2	67.4
100 to 129	2,291.9	818.2	—	655.3
90 to 99	481.8	474.6	—	402.8
80 to 89	276.2	580.2	2.9	556.1
70 to 79	167.6	585.2	1.6	639.0
60 to 69	96.8	565.4	11.4	585.9
50 to 59	76.7	455.4	21.3	490.9
40 to 49	42.8	299.2	58.4	398.8
30 to 39	58.0	260.3	171.4	262.4
20 to 29	7.1	151.3	311.1	152.7
10 to 19	7.3	74.2	815.3	104.9
Less than 10	—	44.1	2,983.7	65.1
All classes	4,381.3	4,381.3	4,381.3	4,381.3

Table 17.—*Area of commercial forest land in the Hill Country of Ohio, by site classes and geographic units, 1967*

[In thousands of acres]

Site class [1] (cubic-foot growth per acre per year)	South-Central	South-eastern	East-Central	Total
Over 120	94.2	79.5	156.5	330.2
85 to 120	262.3	201.4	249.1	712.8
50 to 85	582.6	454.7	666.9	1,704.2
Under 50	602.6	537.1	494.4	1,634.1
All classes	1,541.7	1,272.7	1,566.9	4,381.3
	Sampling errors, in percent			
Over 120	18	20	15	10
85 to 120	10	12	12	7
50 to 85	6	7	7	4
Under 50	6	7	8	4

[1] Site class is the potential growth per acre attainable in fully stocked stands at culmination of mean annual growth.

Table 18.—*Area of commercial forest land in the Hill Country of Ohio, by forest types and geographic units, 1967*

[In thousands of acres]

Forest type	South-Central	South-eastern	East-Central	Total
White-red pine [1]	8.7	6.1	37.5	52.3
Virginia-shortleaf pine	106.2	57.0	11.7	174.9
Oak-pine	110.1	74.7	112.9	297.7
Oak-hickory	924.7	768.2	600.2	2,293.1
Oak-gum	8.5	13.2	4.3	26.0
Elm-ash-cottonwood	196.9	149.4	457.7	804.0
Maple-beech-birch	180.4	197.2	303.3	680.9
Aspen-paper birch	6.2	6.9	39.3	52.4
All types	1,541.7	1,272.7	1,566.9	4,381.3
Sampling errors, in percent				
White-red-pine	*	*	33	26
Virginia-shortleaf pine	17	26	*	14
Oak-pine	17	23	21	12
Oak-hickory	4	5	7	3
Oak-gum	*	*	*	42
Elm-ash-cottonwood	12	16	8	6
Maple-beech-birch	14	13	10	7
Aspen-paper birch	*	*	31	25

[1] Includes a small acreage in spruce plantations.
* Sampling error over 50 percent.

Table 19.—*Number of growing-stock trees on commercial forest land in the Hill Country of Ohio by diameter classes and species groups, 1967*

[In thousands of trees]

Diameter class (inches)	All species	Softwoods	Hardwoods
1.0 to 2.9	557,430	25,717	531,713
3.0 to 4.9	229,478	18,418	211,060
5.0 to 6.9	113,045	8,656	104,389
7.0 to 8.9	70,806	4,930	65,876
9.0 to 10.9	47,089	2,316	44,773
11.0 to 12.9	29,713	1,065	28,648
13.0 to 14.9	18,337	447	17,890
15.0 to 16.9	10,334	109	10,225
17.0 to 18.9	5,430	80	5,350
19.0 to 20.9	2,789	5	2,784
21.0 and larger	3,048	17	3,031
All classes	1,087,499	61,760	1,025,739

Table 20.—*Net volume of timber on commercial forest land in the Hill Country of Ohio, by class of timber and geographic units, 1967*

[In millions of cubic feet]

Class of timber	South-Central	South-eastern	East-Central	Total
Sawtimber trees:				
Sawlogs	584.5	445.3	438.0	1,467.8
Upper stems	134.1	103.2	100.9	338.2
Total	718.6	548.5	538.9	1,806.0
Poletimber trees	433.8	300.7	346.3	1,080.8
Total growing stock	1,152.4	849.2	885.2	2,886.8
Rough trees:				
Sawtimber size	47.5	33.1	56.9	137.5
Poletimber size	41.4	21.2	35.0	97.6
Total	88.9	54.3	91.9	235.1
Rotten trees:				
Sawtimber size	44.3	42.4	40.0	126.7
Poletimber size	15.5	9.8	8.3	33.6
Total	59.8	52.2	48.3	160.3
Total, all timber	1,301.1	955.7	1,025.4	3,282.2
	Sampling errors, in percent			
Sawtimber trees	3	3	3	2
Poletimber trees	3	4	4	2
All growing stock	2	2	3	1
Rough trees	7	8	9	5
Rotten trees	6	8	9	5

Table 21.—*Net volume of timber on commercial forest land in the Hill Country of Ohio, by class of timber and species groups, 1967*

[In millions of cubic feet]

Class of timber	Softwoods	Hardwoods	All species
Sawtimber trees:			
Sawlogs	52.3	1,415.5	1,467.8
Upper stems	7.9	330.3	338.2
Total	60.2	1,745.8	1,806.0
Poletimber trees	49.9	1,030.9	1,080.8
Total growing stock	110.1	2,776.7	2,886.8
Rough trees:			
Sawtimber size	1.3	136.2	137.5
Poletimber size	3.2	94.4	97.6
Total	4.5	230.6	235.1
Rotten trees:			
Sawtimber size	.9	125.8	126.7
Poletimber size	.4	33.2	33.6
Total	1.3	159.0	160.3
Total, all timber	115.9	3,166.3	3,282.2

Table 22.—*Net volume of growing stock on commercial forest land in the Hill Country of Ohio, by ownership classes and geographic units, 1967*

[In millions of cubic feet]

Ownership class and species group	South-Central	South-eastern	East-Central	Total
National forest:				
Softwoods	3.6	4.2	0.3	8.1
Hardwoods	40.5	48.8	3.5	92.8
Total	44.1	53.0	3.8	100.9
Other public:				
Softwoods	7.0	1.0	2.8	10.8
Hardwoods	121.2	41.5	8.6	171.3
Total	128.2	42.5	11.4	182.1
Forest industry:				
Softwoods	1.3	3.1	—	4.4
Hardwoods	61.3	44.2	6.6	112.1
Total	62.6	47.3	6.6	116.5
Other private:				
Softwoods	42.2	19.3	25.3	86.8
Hardwoods	875.3	687.1	838.1	2,400.5
Total	917.5	706.4	863.4	2,487.3
All ownerships:				
Softwoods	54.1	27.6	28.4	110.1
Hardwoods	1,098.3	821.6	856.8	2,776.7
Total	1,152.4	849.2	885.2	2,886.8
Sampling errors, in percent				
Totals only:				
National forest	9	9	9	9
Other public	16	22	44	13
Forest industry	23	28	*	17
Other private	4	4	3	2

* Sampling errors of 50 to 99 percent.

Table 23.—*Net volume of sawtimber on commercial forest land in the Hill Country of Ohio, by ownership classes and geographic units, 1967*

[In millions of board feet]

Ownership class and species group	South-Central	South-eastern	East-Central	Total
National forest:				
Softwoods	9.7	11.6	0.8	22.1
Hardwoods	150.2	180.6	13.1	343.9
Total	159.9	192.2	13.9	366.0
Other public:				
Softwoods	29.5	3.2	1.0	33.7
Hardwoods	412.8	158.4	23.8	595.0
Total	442.3	161.6	24.8	628.7
Forest industry:				
Softwoods	4.4	13.8	—	18.2
Hardwoods	233.7	150.5	23.5	407.7
Total	238.1	164.3	23.5	425.9
Other private:				
Softwoods	145.0	51.2	68.0	264.2
Hardwoods	2,828.6	2,383.6	2,902.9	8,115.1
Total	2,973.6	2,434.8	2,970.9	8,379.3
All ownerships:				
Softwoods	188.6	79.8	69.8	338.2
Hardwoods	3,625.3	2,873.1	2,963.3	9,461.7
Total	3,813.9	2,952.9	3,033.1	9,799.9
Sampling errors, in percent				
Totals only:				
National forest	11	11	11	11
Other public	17	23	*	14
Forest industry	26	30	*	19
Other private	3	5	3	2

* Sampling errors of 50 to 99 percent.

Table 24.—*Net volume of growing stock on commercial forest land in the Hill Country of Ohio, by stand-size classes and geographic units, 1967*

[In millions of cubic feet]

Stand-size class and species group	South-Central	South-eastern	East-Central	Total
Sawtimber stands:				
Softwoods	19.9	7.3	12.7	39.9
Hardwoods	609.5	477.6	429.5	1,516.6
Total	629.4	484.9	442.2	1,556.5
Poletimber stands:				
Softwoods	19.0	10.7	12.2	41.9
Hardwoods	198.6	119.4	150.9	468.9
Total	217.6	130.1	163.1	510.8
Other stands:				
Softwoods	15.2	9.6	3.5	28.3
Hardwoods	290.2	224.6	276.4	791.2
Total	305.4	234.2	279.9	819.5
All stands:				
Softwoods	54.1	27.6	28.4	110.1
Hardwoods	1,098.3	821.6	856.8	2,776.7
Total	1,152.4	849.2	885.2	2,886.8
	Sampling errors, in percent			
Sawtimber stands	5	5	7	3
Poletimber stands	11	14	13	7
Other stands	7	8	8	4
All stands:				
Softwoods	16	22	40	14
Hardwoods	2	2	3	1
Total	2	2	3	1

Table 25.—*Net volume of sawtimber on commercial forest land in the Hill Country of Ohio, by stand-size classes and geographic units, 1967*

[In millions of board feet]

Stand-size class and species group	South-Central	South-eastern	East-Central	Total
Sawtimber stands:				
Softwoods	87.2	29.7	51.1	168.0
Hardwoods	2,383.6	1,938.1	1,789.1	6,110.8
Total	2,470.8	1,967.8	1,840.2	6,278.8
Poletimber stands:				
Softwoods	51.9	25.1	4.3	81.3
Hardwoods	427.3	255.5	344.0	1,026.8
Total	479.2	280.6	348.3	1,108.1
Other stands:				
Softwoods	49.5	25.0	14.4	88.9
Hardwoods	814.4	679.5	830.2	2,324.1
Total	863.9	704.5	844.6	2,413.0
All stands:				
Softwoods	188.6	79.8	69.8	338.2
Hardwoods	3,625.3	2,873.1	2,963.3	9,461.7
Total	3,813.9	2,952.9	3,033.1	9,799.9
	Sampling errors, in percent			
Sawtimber stands	5	5	6	3
Poletimber stands	13	16	16	9
Other stands	9	10	10	6
All stands:				
Softwoods	17	23	*	15
Hardwoods	3	3	3	2
Total	3	3	3	2

* Sampling error of 50 to 99 percent.

Table 26.—*Growing-stock volume in the South-Central Unit of Ohio, by species and diameter classes, 1967*

[In millions of cubic feet]

Species	All classes	Diameter class (inches at breast height)									
		5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
White and red pine	1.1	0.9	0.2	—	—	—	—	—	—	—	—
Virginia pine	35.4	3.9	10.0	9.2	7.2	4.1	0.5	0.5	—	—	—
Other yellow pine	14.9	1.2	2.9	3.9	1.8	1.9	1.8	1.1	0.2	0.1	—
Other softwoods	2.7	.5	.8	.5	—	.4	—	.2	—	—	0.3
Total softwoods	54.1	6.5	13.9	13.6	9.0	6.4	2.3	1.8	0.2	0.1	0.3
Select white oaks	192.3	11.0	18.0	30.2	34.9	29.2	27.7	15.6	8.6	15.0	2.1
Select red oaks	72.0	2.6	5.9	8.2	11.5	11.1	10.4	6.3	5.3	9.8	.9
Chestnut oak [1]	151.2	9.3	18.6	28.1	26.2	26.3	17.5	11.7	7.1	5.7	.7
Other red oaks	152.0	3.7	13.4	23.6	23.8	27.0	21.0	19.8	8.6	10.8	.3
Hickory	135.5	12.6	24.8	29.3	27.9	19.2	10.4	5.9	2.8	2.6	—
Sugar maple	51.7	7.8	10.8	8.9	7.4	5.3	5.3	2.2	2.4	1.3	.3
Soft maples	28.6	4.9	5.2	4.4	4.8	4.7	1.6	.4	.5	1.5	.6
Beech	15.8	.8	.8	1.1	2.0	2.2	1.8	1.2	2.7	2.3	.9
White ash [1]	57.1	5.3	6.7	10.6	10.7	9.6	6.3	3.4	1.8	2.7	—
Aspen [1]	5.9	.8	1.6	.8	1.0	.4	—	—	.3	1.0	—
Basswood	6.5	.3	.4	1.3	1.1	1.3	.8	.7	.2	.4	—
Yellow-poplar	74.7	3.8	7.3	9.9	11.8	11.1	11.8	9.3	3.6	5.1	1.0
Black walnut	22.6	1.9	4.5	4.2	3.7	2.9	2.3	1.2	.9	1.0	—
Black cherry	13.4	.6	2.2	3.7	1.7	3.1	1.3	.1	.2	.5	—
Sycamore	24.9	1.8	1.5	2.7	3.2	3.6	2.6	2.8	1.2	3.7	1.8
Black locust	11.3	3.1	2.7	3.8	.7	.4	.2	.2	.2	—	—
Elm	27.1	4.3	4.9	6.5	2.9	4.7	2.3	1.0	—	.5	—
Sassafras	15.9	5.1	6.2	2.1	1.7	.8	—	—	—	—	—
Other hardwoods	39.8	4.6	7.0	7.2	4.7	6.1	5.2	3.6	.7	.7	—
Total hardwoods	1,098.3	84.3	142.5	186.6	181.7	169.0	128.5	85.4	47.1	64.6	8.6
All species	1,152.4	90.8	156.4	200.2	190.7	175.4	130.8	87.2	47.3	64.7	8.9

[1] Includes a small volume of other closely related species. See table 9.

Table 27.—*Growing-stock volume in the Southeastern Unit of Ohio, by species and diameter classes, 1967*

[In millions of cubic feet]

Species	All classes	Diameter class (inches at breast height)									
		5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
White and red pine	6.3	2.7	1.7	0.5	0.5	0.6	0.3	—	—	—	—
Virginia pine	14.7	1.9	3.8	3.9	3.2	1.4	—	0.5	—	—	—
Other yellow pine	4.9	.5	1.2	.3	1.7	.7	—	.4	—	0.1	—
Other softwoods	1.7	1.2	.3	—	—	.2	—	—	—	—	—
Total softwoods	27.6	6.3	7.0	4.7	5.4	2.9	0.3	0.9	—	0.1	—
Select white oaks	154.1	6.9	12.0	25.3	30.0	30.8	17.5	15.1	4.6	7.7	4.2
Select red oaks	65.4	1.9	3.8	9.1	8.5	7.5	8.6	7.5	6.4	10.6	1.5
Chestnut oak [1]	72.8	4.2	10.2	11.3	16.8	9.9	9.1	3.0	3.1	5.2	—
Other red oaks	120.7	3.3	7.4	13.9	18.5	17.8	16.1	18.3	8.5	14.9	2.0
Hickory	87.9	9.3	18.3	16.4	18.9	10.5	9.1	4.4	.5	.5	—
Sugar maple	37.2	5.0	6.2	6.6	7.3	4.0	3.0	2.3	2.0	.6	.2
Soft maples	20.1	3.2	4.8	4.5	2.4	2.0	1.4	1.6	—	.2	—
Beech	23.6	1.1	1.8	2.3	3.2	2.9	4.6	1.2	1.2	4.5	.8
White ash [1]	28.6	3.9	3.6	5.0	5.9	2.3	3.8	1.8	1.5	.5	.3
Aspen [1]	9.6	2.6	3.0	1.2	1.1	1.4	—	—	—	.3	—
Basswood	5.1	.2	.6	.8	.8	.6	.6	.9	.6	—	—
Yellow-poplar	86.4	5.5	9.8	13.3	9.6	15.3	12.7	6.0	5.9	7.4	.9
Black walnut	18.8	1.7	2.9	2.6	3.1	3.3	2.5	1.1	1.3	.3	—
Black cherry	10.1	.6	2.1	2.0	1.6	2.2	1.0	.3	—	.3	—
Sycamore	17.2	1.2	1.4	1.8	1.9	1.4	2.0	1.4	.7	3.5	1.9
Black locust	5.4	.6	1.2	1.5	1.4	.7	—	—	—	—	—
Elm	31.0	3.6	6.3	5.9	4.7	3.6	1.6	2.0	2.3	.8	.2
Sassafras	4.1	1.3	1.2	.5	.3	.8	—	—	—	—	—
Other hardwoods	23.5	3.0	5.3	2.4	4.9	2.4	1.6	1.7	1.1	.8	.3
Total hardwoods	821.6	59.1	101.9	126.4	140.9	119.4	95.2	68.6	39.7	58.1	12.3
All species	849.2	65.4	108.9	131.1	146.3	122.3	95.5	69.5	39.7	58.2	12.3

[1] Includes a small volume of other closely related species. See table 9.

Table 28.—*Growing-stock volume in the East-Central Unit of Ohio, by species and diameter classes, 1967*

[In millions of cubic feet]

Species	All classes	Diameter class (inches at breast height)									
		5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
White and red pine	18.3	3.7	7.5	3.6	2.4	0.6	0.3	—	—	0.2	—
Virginia pine	.4	—	.3	.1	—	—	—	—	—	—	—
Other yellow pine	4.0	2.6	1.1	.3	—	—	—	—	—	—	—
Other softwoods	5.7	.5	.5	2.0	1.1	.3	.3	0.3	—	.7	—
Total softwoods	28.4	6.8	9.4	6.0	3.5	0.9	0.6	0.3	—	0.9	—
Select white oaks	97.9	5.3	10.5	12.2	12.4	15.0	11.8	8.9	5.8	12.1	3.9
Select red oaks	60.0	2.7	6.5	7.9	6.9	4.1	4.3	6.2	3.6	13.6	4.2
Chestnut oak [1]	21.0	.9	1.2	3.1	3.1	1.8	3.2	2.9	1.9	2.9	—
Other red oaks	84.3	3.3	7.6	11.9	14.1	11.3	10.8	8.0	6.8	8.0	2.5
Hickory	80.7	7.3	12.5	12.0	14.7	13.2	8.6	4.6	4.3	3.5	—
Sugar maple	35.6	5.1	5.8	6.4	3.5	5.6	4.2	2.1	1.2	.9	.8
Soft maple	42.1	6.8	7.9	6.7	7.5	6.2	3.3	1.7	.8	1.2	—
Beech	37.3	1.4	2.8	2.5	3.8	4.9	4.3	3.7	5.7	6.0	2.2
White ash [1]	40.9	3.3	4.1	7.3	7.6	5.5	4.4	2.6	3.2	2.7	.2
Aspen [1]	20.4	5.1	5.5	2.7	3.2	3.2	.5	.2	—	—	—
Basswood	6.0	.3	.3	.4	.4	1.5	.5	.4	1.7	.5	—
Yellow-poplar	88.9	6.5	10.0	11.9	15.9	13.6	12.0	6.3	3.9	8.0	.8
Black walnut	27.0	4.0	4.7	5.6	6.0	1.7	3.2	.8	.4	.6	—
Black cherry	51.9	6.8	10.9	10.4	11.7	5.9	3.4	1.0	1.3	.5	—
Sycamore	9.6	.1	1.0	.2	.3	1.6	1.2	2.2	.6	1.3	1.1
Black locust	22.3	5.2	5.8	5.6	1.3	2.1	1.1	.9	.3	—	—
Elm	101.8	11.0	16.5	20.7	15.8	13.9	9.9	3.7	3.1	5.7	1.5
Sassafras	7.1	2.8	2.3	1.0	.5	.3	.2	—	—	—	—
Other hardwoods	22.0	1.8	2.9	3.1	3.9	3.6	3.2	2.1	—	1.4	—
Total hardwoods	856.8	79.7	118.8	131.6	132.6	115.0	90.1	58.3	44.6	68.9	17.2
All species	885.2	86.5	128.2	137.6	136.1	115.9	90.7	58.6	44.6	69.8	17.2

[1] Includes a small volume of other related species. See table 9.

Table 29.—*Total growing-stock volume in the Hill Country of Ohio, by species and diameter classes, 1967*

[In millions of cubic feet]

Species	All classes	Diameter class (inches at breast height)									
		5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
White and red pine	25.7	7.3	9.4	4.1	2.9	1.2	0.6	—	—	0.2	—
Virginia pine	50.5	5.8	14.1	13.2	10.4	5.5	.5	1.0	—	—	—
Other yellow pines	23.8	4.3	5.2	4.5	3.5	2.6	1.8	1.5	0.2	.2	—
Other softwoods	10.1	2.2	1.6	2.5	1.1	.9	.3	.5	—	.7	0.3
Total softwoods	110.1	19.6	30.3	24.3	17.9	10.2	3.2	3.0	0.2	1.1	0.3
Select white oaks	444.3	23.2	40.5	67.7	77.3	75.0	57.0	39.6	19.0	34.8	10.2
Select red oaks	197.4	7.2	16.2	25.2	26.9	22.7	23.3	20.0	15.3	34.0	6.6
Chestnut oak [1]	245.0	14.4	30.0	42.5	46.1	38.0	29.8	17.6	12.1	13.8	.7
Other red oaks	357.0	10.3	28.4	49.4	56.4	56.1	47.9	46.1	23.9	33.7	4.8
Hickory	304.1	29.2	55.6	57.7	61.5	42.9	28.1	14.9	7.6	6.6	—
Sugar maple	124.5	17.9	22.8	21.9	18.2	14.9	12.5	6.6	5.6	2.8	1.3
Soft maples	90.8	14.9	17.9	15.6	14.7	12.9	6.3	3.7	1.3	2.9	.6
Beech	76.7	3.3	5.4	5.9	9.0	10.0	10.7	6.1	9.6	12.8	3.9
White ash [1]	126.6	12.5	14.4	22.9	24.2	17.4	14.5	7.8	6.5	5.9	.5
Aspen [1]	35.9	8.5	10.1	4.7	5.3	5.0	.5	.2	.3	1.3	—
Basswood	17.6	.8	1.3	2.5	2.3	3.4	1.9	2.0	2.5	.9	—
Yellow-poplar	250.0	15.8	27.1	35.1	37.3	40.0	36.5	21.6	13.4	20.5	2.7
Black walnut	68.4	7.6	12.1	12.4	12.8	7.9	8.0	3.1	2.6	1.9	—
Black cherry	75.4	8.0	15.2	16.1	15.0	11.2	5.7	1.4	1.5	1.3	—
Sycamore	51.7	3.1	3.9	4.7	5.4	6.6	5.8	6.4	2.5	8.5	4.8
Black locust	39.0	8.9	9.7	10.9	3.4	3.2	1.3	1.1	.5	—	—
Elm	159.9	18.9	27.7	33.1	23.4	22.2	13.8	6.7	5.4	7.0	1.7
Sassafras	27.1	9.2	9.7	3.6	2.5	1.9	.2	—	—	—	—
Other hardwoods	85.3	9.4	15.2	12.7	13.5	12.1	10.0	7.4	1.8	2.9	.3
Total hardwoods	2,776.7	223.1	363.2	444.6	455.2	403.4	313.8	212.3	131.4	191.6	38.1
All species	2,886.8	242.7	393.5	468.9	473.1	413.6	317.0	215.3	131.6	192.7	38.4

[1] Includes a small volume of other related species. See table 9.

Table 30.—*Sawtimber volume in the South-Central Unit of Ohio, by species and diameter classes, 1967*

[In millions of board feet]

Species	All classes	Diameter class (inches at breast height)							
		9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
White and red pine	—	—	—	—	—	—	—	—	—
Virginia pine	117.8	46.7	40.4	24.5	3.1	3.1	—	—	—
Other yellow pine	61.4	19.3	10.7	11.2	11.4	6.8	1.6	0.4	—
Other softwoods	9.4	3.5	—	2.6	—	1.4	—	—	1.9
Total softwoods	188.6	69.5	51.1	38.3	14.5	11.3	1.6	0.4	1.9
Select white oaks	698.8	—	182.7	155.9	146.9	79.6	45.2	77.9	10.6
Select red oaks	294.8	—	56.7	59.6	54.3	34.0	29.6	55.4	5.2
Chestnut oak [1]	485.8	—	130.0	133.3	91.2	59.6	37.3	30.6	3.8
Other red oaks	588.1	—	116.0	145.4	110.6	105.2	47.9	60.9	2.1
Hickory	337.7	—	133.4	95.1	52.0	29.5	14.4	13.3	—
Sugar maple	143.5	—	42.7	31.5	31.6	13.2	14.6	8.5	1.4
Soft maples	85.5	—	28.7	28.3	9.7	2.4	2.7	9.9	3.8
Beech	85.7	—	12.3	14.9	11.5	7.5	18.5	15.0	6.0
White ash [1]	170.8	—	53.1	47.5	31.4	16.4	9.2	13.2	—
Aspen [1]	13.8	—	5.2	2.1	—	—	1.3	5.2	—
Basswood	24.5	—	5.7	7.4	4.4	3.7	1.0	2.3	—
Yellow-poplar	311.6	—	66.2	64.9	68.6	54.4	21.5	30.5	5.5
Black walnut	62.3	—	18.5	15.5	12.7	6.2	4.4	5.0	—
Black cherry	35.0	—	8.2	15.8	6.5	.6	1.3	2.6	—
Sycamore	98.4	—	17.4	19.1	13.2	14.0	6.4	19.2	9.1
Black locust	9.3	—	3.3	2.2	1.2	1.3	1.3	—	—
Elm	59.0	—	15.2	24.4	11.8	5.2	—	2.4	—
Sassafras	13.6	—	9.2	4.4	—	—	—	—	—
Other hardwoods	107.1	—	23.8	31.7	26.4	18.0	3.7	3.5	—
Total hardwoods	3,625.3	—	928.3	899.0	684.0	450.8	260.3	355.4	47.5
All species	3,813.9	69.5	979.4	937.3	698.5	462.1	261.9	355.8	49.4

[1] Includes a small volume of other closely related species. See table 10.

Table 31.—*Sawtimber volume in the Southeastern Unit of Ohio, by species and diameter classes, 1967*

[In millions of board feet]

Species	All classes	Diameter class (inches at breast height)							
		9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
White and red pine	10.6	2.5	3.0	3.3	1.8	—	—	—	—
Virginia pine	49.3	20.0	17.2	8.4	—	3.7	—	—	—
Other yellow pine	18.5	1.0	9.6	4.7	.4	2.3	—	0.5	—
Other softwoods	1.4	—	—	1.4	—	—	—	—	—
Total softwoods	79.8	23.5	29.8	17.8	2.2	6.0	—	0.5	—
Select white oaks	579.9	—	157.7	165.5	93.1	78.5	23.7	40.7	20.7
Select red oaks	270.8	—	40.7	39.2	44.6	41.1	36.3	60.1	8.8
Chestnut oak [1]	241.4	—	82.5	52.3	47.5	15.7	16.3	27.1	—
Other red oaks	508.7	—	89.3	93.3	84.9	98.7	48.0	84.1	10.4
Hickory	214.1	—	89.4	51.5	46.4	21.5	2.6	2.7	—
Sugar maple	115.0	—	42.7	24.3	17.6	13.9	12.0	3.3	1.2
Soft maples	46.1	—	14.2	12.0	8.2	10.0	.4	1.3	—
Beech	121.3	—	22.0	19.3	30.4	7.8	7.3	29.8	4.7
White ash [1]	80.7	—	29.3	11.8	19.4	8.3	7.9	2.6	1.4
Aspen [1]	14.4	—	5.3	7.4	—	—	—	1.7	—
Basswood	19.1	—	3.6	3.3	3.7	5.0	3.5	—	—
Yellow-poplar	338.1	—	53.3	88.4	74.9	35.6	34.8	45.2	5.9
Black walnut	68.7	—	18.6	21.8	14.7	5.4	6.8	1.4	—
Black cherry	28.1	—	7.6	11.3	5.7	2.0	—	1.5	—
Sycamore	66.4	—	9.6	7.6	10.8	7.0	3.8	18.1	9.5
Black locust	10.5	—	7.0	3.5	—	—	—	—	—
Elm	78.8	—	23.8	19.5	7.9	10.2	12.0	4.2	1.2
Sassafras	5.2	—	1.2	4.0	—	—	—	—	—
Other hardwoods	65.8	—	24.5	12.8	8.1	8.7	5.8	4.5	1.4
Total hardwoods	2,873.1	—	722.3	648.8	517.9	369.4	221.2	328.3	65.2
All species	2,952.9	23.5	752.1	666.6	520.1	375.4	221.2	328.8	65.2

[1] Includes a small volume of other closely related species. See table 10.

Table 32.—*Sawtimber volume in the East-Central Unit of Ohio, by species and diameter classes, 1967*

Table 32.—*Sawtimber volume in the East-Central Unit of Ohio, by species and diameter classes, 1967*

[In millions of board feet]

Species	All classes	Diameter class (inches at breast height)							
		9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
White and red pine	40.8	19.4	14.2	3.8	2.0	—	—	1.4	—
Virginia pine	.6	.3	.2	.1	—	—	—	—	—
Other yellow pines	1.6	1.5	—	—	—	0.1	—	—	—
Other softwoods	26.8	10.5	6.7	1.8	1.5	2.1	—	4.2	—
Total softwoods	69.8	31.7	21.1	5.7	3.5	2.2	—	5.6	—
Select white oaks	382.7	—	69.1	84.7	63.7	48.1	32.0	65.1	20.0
Select red oaks	238.6	—	35.4	21.7	24.1	33.2	20.3	79.9	24.0
Chestnut oaks [1]	84.2	—	15.9	9.9	16.5	15.0	10.7	16.2	—
Other red oaks	337.0	—	72.4	61.4	59.0	44.0	38.8	47.2	14.2
Hickory	252.9	—	74.5	68.1	43.9	24.1	22.9	19.4	—
Sugar maple	115.3	—	21.8	35.3	26.7	12.9	7.8	6.0	4.8
Soft maples	130.6	—	46.3	39.4	20.9	10.9	5.4	7.7	—
Beech	210.5	—	24.8	34.3	30.2	25.5	39.8	40.9	15.0
White ash [1]	136.6	—	40.2	28.0	22.8	13.3	17.0	14.1	1.2
Aspen [1]	38.2	—	16.9	17.1	2.9	1.3	—	—	—
Basswood	29.1	—	2.0	8.3	3.2	2.6	9.8	3.2	—
Yellow-poplar	367.8	—	93.9	83.1	72.8	38.6	24.9	49.5	5.0
Black walnut	69.4	—	33.3	8.9	17.8	4.5	1.9	3.0	—
Black cherry	124.5	—	58.7	31.1	18.4	5.5	7.8	3.0	—
Sycamore	45.4	—	1.6	8.8	6.7	12.4	3.0	7.2	5.7
Black locust	31.3	—	7.1	12.1	5.9	4.6	1.6	—	—
Elm	288.1	—	85.4	75.1	53.0	19.2	17.1	30.6	7.7
Sassafras	5.2	—	2.5	1.5	1.2	—	—	—	—
Other hardwoods	75.9	—	20.0	19.3	17.5	11.2	—	7.9	—
Total hardwoods	2,963.3	—	721.8	648.1	507.2	326.9	260.8	400.9	97.6
All species	3,033.1	31.7	742.9	653.8	510.7	329.1	260.8	406.5	97.6

[1] Includes a small volume of other related species. See table 10.

Table 33.—*Total sawtimber volume in the Hill Country of Ohio, by species and diameter classes, 1967*

[In millions of board feet]

Species	All classes	Diameter class (inches at breast height)							
		9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
White and red pine	51.4	21.9	17.2	7.1	3.8	—	—	1.4	—
Virginia pine	167.7	67.0	57.8	33.0	3.1	6.8	—	—	—
Other yellow pines	81.5	21.8	20.3	15.9	11.8	9.2	1.6	.9	—
Other softwoods	37.6	14.0	6.7	5.8	1.5	3.5	—	4.2	1.9
Total softwoods	338.2	124.7	102.0	61.8	20.2	19.5	1.6	6.5	1.9
Select white oaks	1,661.4	—	409.5	406.1	303.7	206.2	100.9	183.7	51.3
Select red oaks	804.2	—	132.8	120.5	123.0	108.3	86.2	195.4	38.0
Chestnut oaks [1]	811.4	—	228.4	195.5	155.2	90.3	64.3	73.9	3.8
Other red oaks	1,433.8	—	277.7	300.1	254.5	247.9	134.7	192.2	26.7
Hickory	804.7	—	297.3	214.7	142.3	75.1	39.9	35.4	—
Sugar maples	373.8	—	107.2	91.1	75.9	40.0	34.4	17.8	7.4
Soft maples	262.2	—	89.2	79.7	38.8	23.3	8.5	18.9	3.8
Beech	417.5	—	59.1	68.5	72.1	40.8	65.6	85.7	25.7
White ash [1]	389.2	—	123.7	87.3	73.6	38.0	34.1	29.9	2.6
Aspen [1]	66.4	—	27.4	26.6	2.9	1.3	1.3	6.9	—
Basswood	72.7	—	11.3	19.0	11.3	11.3	14.3	5.5	—
Yellow-poplar	1,017.5	—	213.4	236.4	216.3	128.6	81.2	125.2	16.4
Black walnut	200.4	—	70.4	46.2	45.2	16.1	13.1	9.4	—
Black cherry	187.6	—	74.5	58.2	30.6	8.1	9.1	7.1	—
Sycamore	210.2	—	28.6	35.5	30.7	33.4	13.2	44.5	24.3
Black locust	51.1	—	17.4	17.8	7.1	5.9	2.9	—	—
Elm	425.9	—	124.4	119.0	72.7	34.6	29.1	37.2	8.9
Sassafras	24.0	—	12.9	9.9	1.2	—	—	—	—
Other hardwoods	247.7	—	67.2	63.8	52.0	37.9	9.5	15.9	1.4
Total hardwoods	9,461.7	—	2,372.4	2,195.9	1,709.1	1,147.1	742.3	1,084.6	210.3
All species	9,799.9	124.7	2,474.4	2,257.7	1,729.3	1,166.6	743.9	1,091.1	212.2

[1] Includes a small volume of other closely related species. See table 10.

Table 34.—*Sampling errors for growing-stock and sawtimber volumes in the Hill Country of Ohio, by geographic units and species, 1967*

[In percent]

Species	Growing stock				Sawtimber			
	South-Central	South-eastern	East Central	Total	South-Central	South-eastern	East-Central	Total
White and red pine	46	*	*	39	—	*	*	*
Virginia pine	21	27	**	17	23	28	—	18
Other yellow pines	29	32	**	26	30	38	**	21
Other softwoods	37	*	*	39	*	**	*	46
Total softwoods	16	22	45	15	17	23	*	17
Select white oaks	7	7	11	4	8	8	12	5
Select red oaks	9	9	10	6	10	10	12	6
Chestnut oak	10	12	42	8	11	13	*	9
Other red oaks	7	8	12	5	8	9	12	5
Hickory	7	8	11	5	10	11	13	6
Sugar maple	13	13	16	8	16	15	18	10
Soft maples	16	17	13	9	21	23	17	12
Beech	21	15	17	10	23	17	19	12
White ash	12	15	15	8	15	17	19	10
Aspen	39	22	21	15	*	44	32	25
Basswood	28	34	41	21	30	39	49	26
Yellow-poplar	11	12	17	8	12	15	19	9
Black walnut	17	16	18	10	20	21	22	12
Black cherry	22	19	12	9	28	23	20	13
Sycamore	19	24	35	14	21	26	41	15
Black locust	18	29	26	16	35	36	38	24
Elm	13	14	11	8	17	18	13	10
Sassafras	23	33	20	15	35	*	*	26
Other hardwoods	10	16	16	8	14	18	19	10
Total hardwoods	2	2	3	1	3	3	4	2
All species	2	2	3	1	3	3	3	2

* Sampling areas of 50 to 99 percent.
** Sampling areas of more than 100 percent.

Table 35.—*Sawtimber volume in the South-Central Unit of Ohio, by species and log quality classes, 1967*

[In millions of board feet]

Species	All classes	Standard-lumber logs			Other [1]
		Grade 1	Grade 2	Grade 3	
White and red pine	—	—	—	—	—
Virginia pine	117.8	1.3	6.1	81.4	29.0
Other yellow pines	61.4	1.6	10.8	33.6	15.4
Other softwoods [2]	9.4	—	—	—	—
Total softwoods	188.6	2.9	16.9	115.0	44.4
Select white oaks	698.8	70.5	172.3	363.1	92.9
Select red oaks	294.8	55.4	77.6	129.0	32.8
Chestnut oak [3]	485.8	60.0	115.5	233.5	76.8
Other red oaks	588.1	84.1	105.6	304.2	94.2
Hickory	337.7	23.5	44.8	171.6	97.8
Sugar maple	143.5	11.3	22.7	84.3	25.2
Soft maples	85.5	3.5	8.6	48.7	24.7
Beech	85.7	1.3	7.9	51.9	24.6
White ash[3]	170.8	18.9	39.0	77.4	35.5
Aspen [3]	13.8	3.4	1.9	7.4	1.1
Basswood	24.5	1.9	7.1	12.7	2.8
Yellow-poplar	311.6	69.9	71.4	120.5	49.8
Black walnut	62.3	6.0	13.8	36.9	5.6
Black cherry	35.0	3.1	4.0	19.8	8.1
Sycamore	98.4	14.5	22.7	47.1	14.1
Black locust	9.3	—	.8	6.5	2.0
Elm	59.0	3.2	12.8	35.0	8.0
Sassafras	13.6	—	1.5	9.9	2.2
Other hardwoods	107.1	8.8	23.4	56.0	18.9
Total hardwoods	3,625.3	439.3	753.4	1,815.5	617.1

[1] For pines "Other" is grade 4; for hardwoods "Other" is tie-and-timber log grade.

[2] Species other than pine were not graded into standard-lumber log grade.

[3] Includes a small volume of other closely related species.

Table 36.—*Sawtimber volume in the Southeastern Unit of Ohio, by species and log quality classes, 1967*

[In millions of board feet]

Species	All classes	Standard-lumber logs			Other [1]
		Grade 1	Grade 2	Grade 3	
White and red pine	10.6	—	—	7.9	2.7
Virginia pine	49.3	—	1.2	37.1	11.0
Other yellow pines	18.5	1.0	4.3	9.0	4.2
Other softwoods [2]	1.4	—	—	—	—
Total softwoods	79.8	1.0	5.5	54.0	17.9
Select white oaks	579.9	44.7	156.1	278.6	100.5
Select red oaks	270.8	64.9	71.8	96.3	37.8
Chestnut oak [3]	241.4	22.6	64.4	114.2	40.2
Other red oaks	508.7	93.1	106.8	216.4	92.4
Hickory	214.1	7.9	31.5	104.4	70.3
Sugar maple	115.0	9.6	16.6	63.7	25.1
Soft maples	46.1	1.4	12.4	25.0	7.3
Beech	121.3	1.3	9.6	55.3	55.1
White ash [3]	80.7	9.1	20.1	34.2	17.3
Aspen [3]	14.4	—	2.7	8.5	3.2
Basswood	19.1	1.2	4.6	11.0	2.3
Yellow-poplar	338.1	81.5	82.8	122.9	50.9
Black walnut	68.7	3.4	16.0	42.2	7.1
Black cherry	28.1	2.7	5.2	14.2	6.0
Sycamore	66.4	14.1	20.5	23.7	8.1
Black locust	10.5	—	—	7.7	2.8
Elm	78.8	4.8	17.2	35.4	21.4
Sassafras	5.2	—	—	4.7	.5
Other hardwoods	65.8	7.8	14.0	31.7	12.3
Total hardwoods	2,873.1	370.1	652.3	1,290.1	560.6

[1] For pines "Other" is grade 4; for hardwoods "Other" is tie-and-timber log grade.

[2] Species other than pine were not graded into standard-lumber log grades.

[3] Includes a small volume of other closely related species.

Table 37.—*Sawtimber volume in the East-Central Unit of Ohio, by species and log quality classes, 1967*

[In millions of board feet]

Species	All classes	Standard-lumber logs			Other[1]
		Grade 1	Grade	Grade 3	
White and red pines	40.8	—	—	26.3	14.5
Virginia pine	.6	—	—	.4	.2
Other yellow pines	1.6	—	—	1.5	.1
Other softwoods [2]	26.8	—	—	—	—
Total softwoods	69.8	—	—	28.2	14.8
Select white oaks	382.7	46.1	95.6	187.0	54.0
Select red oaks	238.6	51.0	53.6	104.2	29.8
Chestnut oak [3]	84.2	7.7	28.4	36.4	11.7
Other red oaks	337.0	28.3	63.9	189.1	55.7
Hickory	252.9	18.0	38.8	98.6	97.5
Sugar maple	115.3	10.1	26.3	56.3	22.6
Soft maples	130.6	4.7	13.3	81.0	31.6
Beech	210.5	4.7	36.7	118.5	50.6
White ash [3]	137.7	12.8	30.4	62.8	31.7
Aspen [3]	38.2	—	5.4	23.5	9.3
Basswood	29.1	2.5	10.3	14.3	2.0
Yellow-poplar	367.8	58.6	59.5	156.2	93.5
Black walnut	69.4	3.4	8.3	45.2	12.5
Black cherry	124.5	3.5	5.5	72.7	42.8
Sycamore	45.4	14.0	10.7	17.4	3.3
Black locust	31.3	—	2.3	24.6	4.4
Elm	288.1	18.2	44.9	174.3	50.7
Sassafras	5.2	.7	.2	3.8	.5
Other hardwoods	74.8	8.1	16.6	39.1	11.0
Total hardwoods	2,963.3	292.4	550.7	1,505.0	615.2

[1] For pine "Other" is grade 4; for hardwoods "Other" is tie-and-timber log grade.

[2] Species other than pine were not graded into standard-lumber log grades.

[3] Includes a small volume of other closely related species.

Table 38.—*Total sawtimber volume in the Hill Country of Ohio, by species and log quality classes, 1967*

[In millions of board feet]

Species	All classes	Standard-lumber logs			Other [1]
		Grade 1	Grade 2	Grade 3	
White and red pine	51.4	—	—	34.2	17.2
Virginia pine	167.7	1.3	7.3	118.9	40.2
Other yellow pines	81.5	2.6	15.1	44.1	19.7
Other softwoods [2]	37.6	—	—	—	—
Total softwoods	338.2	3.9	22.4	197.2	77.1
Select white oaks	1,661.4	161.3	424.0	828.7	247.4
Select red oaks	804.2	171.3	203.0	329.5	100.4
Chestnut oak [3]	811.4	90.3	208.3	384.1	128.7
Other red oaks	1,433.8	205.5	276.3	709.7	242.3
Hickory	804.7	49.4	115.1	374.6	265.6
Sugar maple	373.8	31.0	65.6	204.3	72.9
Soft maples	262.2	9.6	34.3	154.7	63.6
Beech	417.5	7.3	54.2	225.7	130.3
White ash [3]	389.2	40.8	89.5	174.4	84.5
Aspen [3]	66.4	3.4	10.0	39.4	13.6
Basswood	72.7	5.6	22.0	38.0	7.1
Yellow-poplar	1,017.5	210.0	213.7	399.6	194.2
Black walnut	200.4	12.8	38.1	124.3	25.2
Black cherry	187.6	9.3	14.7	106.7	56.9
Sycamore	210.2	42.6	53.9	88.2	25.5
Black locust	51.1	—	3.1	38.8	9-2
Elm	425.9	26.2	74.9	244.7	80.1
Sassafras	24.0	.7	1.7	18.4	3.2
Other hardwoods	247.7	24.7	54.0	126.8	42.2
Total hardwoods	9,461.7	1,101.8	1,956.4	4,610.6	1,792.9

[1] For pine "Other" is grade 4; for hardwoods "Other" is tie-and-timber log grade.

[2] Species other than pine were not graded into standard-lumber log grades.

[3] Includes a small volume of other closely related species.

Table 39.—*Net annual growth of growing stock on commercial forest land in the Hill Country of Ohio, by species and geographic units, 1966*[1]

[In thousands, of cubic feet]

Species	South-Central	South-eastern	East-Central	Total
White and red pine	42	240	578	860
Virginia pine	1,603	299	19	1,921
Other yellow pines	567	187	209	963
Other softwoods	104	65	287	456
Total softwoods	2,316	791	1,093	4,200
Select white oaks	8,122	4,113	3,696	15,931
Select red oaks	1,794	1,247	1,821	4,862
Chestnut oak	3,569	1,735	437	5,741
Other white oaks	52	—	59	111
Other red oaks	7,031	3,451	3,363	13,845
Hickory	4,112	1,955	2,084	8,151
Sugar maple	1,670	1,725	1,609	5,004
Soft maple	1,553	882	1,688	4,123
Beech	211	405	585	1,201
White ash	1,992	763	1,473	4,228
Aspen	124	329	570	1,023
Basswood	202	116	210	528
Yellow-poplar	2,848	4,223	5,296	12,367
Black walnut	977	717	1,981	3,675
Black cherry	597	385	2,800	3,782
Sycamore	904	624	161	1,689
Elm	1,266	1,152	3,729	6,147
Other hardwoods	2,849	1,163	3,134	7,146
Total hardwoods	39,873	24,985	34,696	99,554
All species	42,189	25,776	35,789	103,754

[1] Based on average net annual growth of growing stock, 1952-66.

Table 40.—*Timber removals from growing stock on commercial forest land in the Hill Country of Ohio, by species groups and geographic units, 1966*[1]

[In thousands of cubic feet]

Species	South-Central	South-eastern	East-Central	Total
Softwoods [2]	1,637	512	551	2,700
Select white oaks	2,282	1,817	496	4,595
Select red oaks	1,307	793	1,129	3,229
Chestnut oak [3]	3,882	300	531	4,713
Other red oaks	3,406	2,957	2,479	8,842
Hickory	1,340	353	277	1,970
Other hardwoods [4]	1,885	1,666	1,794	5,345
Soft hardwoods [5]	4,483	1,595	4,176	10,254
Total hardwoods	18,585	9,481	10,882	38,948
All species	20,222	9,993	11,433	41,648

[1] Based on average net annual growing-stock removals, 1952-66.
[2] Mostly yellow pines.
[3] Includes a small volume of other white oaks.
[4] Includes ash, beech, birch, black walnut, buckeye, hackberry, locust, sugar maple, and willow.
[5] Includes aspen, basswood, cherry, cottonwood, dogwood, elm, gum, soft maples, sycamore, and yellow-poplar.

Table 41.—*Net annual growth of sawtimber on commercial forest land in the Hill Country of Ohio, by species and geographic units, 1966*[1]

[In thousands of board feet]

Species	South-Central	South-eastern	East-Central	Total
White and red pine	—	313	1,335	1,648
Virginia pine	6,537	1,866	23	8,426
Other yellow pines	2,016	420	48	2,484
Other softwood	370	34	1,038	1,442
Total softwoods	8,923	2,633	2,444	14,000
Select white oaks	28,949	15,478	15,850	60,277
Select red oaks	6,716	5,776	7,188	19,680
Chestnut oak	12,073	7,633	1,808	21,514
Other white oaks	395	—	—	395
Other red oaks	24,136	12,343	11,474	47,953
Hickory	13,930	5,195	6,887	26,012
Sugar maple	5,634	2,959	4,142	12,735
Soft maple	4,771	2,485	4,613	11,869
Beech	1,144	2,372	3,044	6,560
White ash	4,429	1,860	1,945	8,234
Aspen	384	682	1,599	2,665
Basswood	627	301	707	1,635
Yellow-poplar	12,097	17,039	23,334	52,470
Black walnut	3,779	3,624	3,243	10,646
Black cherry	1,359	1,091	6,929	9,379
Sycamore	4,462	2,819	726	8,007
Elm	1,382	2,294	6,339	10,015
Other hardwoods	6,389	3,163	7,266	16,818
Total hardwoods	132,656	87,114	107,094	326,864
All species	141,579	89,747	109,538	340,864

[1] Based on average net annual growth of sawtimber, 1952-66.

Table 42.—*Timber removals from sawtimber on commercial forest land in the Hill Country of Ohio, by species groups and geographic units, 1966*[1]

[In thousands of board feet]

Species	South-Central	South-eastern	East-Central	Total
Softwoods [2]	7,577	2,372	2,551	12,500
Select white oaks	5,761	7,180	1,634	14,575
Select red oaks	2,647	2,742	5,757	11,146
Chestnut oak [3]	10,117	367	1,666	12,150
Other red oaks	9,055	12,878	10,097	32,030
Hickory	1,622	1,381	899	3,902
Other hard hardwoods [4]	4,751	5,088	5,950	15,789
Soft hardwoods [5]	17,700	2,550	8,896	29,146
Total hardwoods	51,653	32,186	34,899	118,738
All species	59,230	34,558	37,450	131,238

[1] Based on average annual sawtimber removals, 1952-66.
[2] Mostly yellow pines.
[3] Includes a small volume of other white oaks.
[4] Includes ash, beech, birch, black walnut, buckeye, hackberry, locust, sugar maple and willow.
[5] Includes aspen, basswood, cherry, cottonwood, dogwood, elm, gum, soft maples, sycamore, and yellow-poplar.

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